INITIUM

USER MANUAL

Version 2.0 (2005.08)

Promi-SD™ 101/202/205

Bluetooth RS232C Serial Adapter

by Bluetooth

Enabling Wireless Serial Communications

Promi-SD/ESD Series

Bluetooth Serial Adapter	ESD01 	ESD02 	SD101 	SD202 	SD205 
Part Number	**IP11-320**	**IP11-321**	**IP10-300**	**IP10-301**	**IP10-302**
Description	Board-type wireless serial adapter with MMCX antenna connector	Board-type wireless serial adapter with on-board antenna	External type wireless serial adapter with internal battery	External type wireless serial adapter	External type wireless serial adapter with dip switch
Power Class	Class1	Class2	Class2	Class1	Class1
RF Range	Up to 100m	Up to 30m	Up to 30m	Up to 100m	Up to 100m
Power Connector	Header 2.54m	Header 2.54m	DC plug or 9 pin	DC plug or 9 pin	DC plug or 9 pin
Power supply	3.3V	3.3V	5V	5V~12V	5V~12V
Serial connector	2.54mm Header 2x6	2.54mm Header 1x4x2	Female DB9	Female DB9	Female DB9
Serial Interface	UART	UART	RS-232	RS-232	RS-232
Dip switch	No	No	No	No	Yes (4 slots)
Battery	No	No	Yes	No	No
Profile	Serial Port Profile	Serial Port Profile	Serial Port Profile	Serial Port Profile	Serial Port Profile
Applicable Antenna	Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna
Bluetooth Qualified	Fully	Fully	Fully	Fully	Fully
Type Approved	FCC CE	FCC CE	TELEC MIC CE FCC	TELEC MIC CE FCC	MIC CE FCC
Dimensions (H×W×D)	27x27	18x20x11.7	62.5x31.2x16.3	62.5x31.2x16.3	62.5x31.2x16.3
Includes	Stub Antenna Antenna Cable (15cm)		Stub Antenna DC power cable AC/DC power adapter	Stub Antenna DC power cable	Stub Antenna DC power cable
Develop Board Set **ESD01 or ESD02 use only**	**DBS**  Jig Board + Power Adaptor + RS232 Cable **Part Number: IP30-500**				

Promi-MSP Series

Wireless Multi-Serial Adapter	**MSP102A** 	**MSP102B** 
Part Number	**IP20-400**	**IP20-401**
Description	Wireless multi-serial adapter COM port redirector supported Serial/IP Up to 7 links simultaneously	Wireless multi-serial adapter COM port redirector supported Serial/IP Up to 14 links simultaneously
Power Class	Class1	Class1
RF Range	Up to 100m	Up to 100m
Power Connector	DC plug	DC plug
Power supply	5V	5V
Serial connector	Male DB9	Male DB9
Serial Interface	RS-232	RS-232
Dip switch	No	No
Battery	No	No
Profile	LAN Access Dial-up Serial Port Profile	LAN Access Dial-up Serial Port Profile
Applicable Antenna	Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna
Bluetooth Qualified	Fully	Fully
Type Approved	MIC CE FCC	MIC CE FCC
Dimensions (H×W×D)	147x112x32	147x112x32
Includes	Dipole Antenna AC/DC Power Adapter RS232 Cable LAN Cable Mounting Kit CD	Dipole Antenna AC/DC Power Adapter RS232 Cable LAN Cable Mounting Kit CD Bluetooth USB Adapter

Accessories

Antenna	**SAT** 	**DAT** 	**PAT** 	**EAT** 
	IA60-800	**IA60-801**	**IA60-802**	**IA60-820**
	Stub (30mm)	Dipole (120mm)	Patch (130×90×65mm)	Board type (18×6×7mm) ESD01 use only

Power Supply	**EPA** 	**OPA** 	**UPA** 	**DPA** 
	IA70-840	**IA70-841**	**IA70-860**	**IA70-861**
	External Power Adaptor Domestic use only	External Power Adaptor International use	USB power cable	DC power cable

Extension Cable	**RFC** 	**EEC** 	**SPC** 
	IA80-880	**IA80-881**	**IA80-882**
	Antenna extension cable (1m)	Antenna extension cable (15cm) ESD01 use only	Serial power cable + Power adapter

↘ For more information, please contact:

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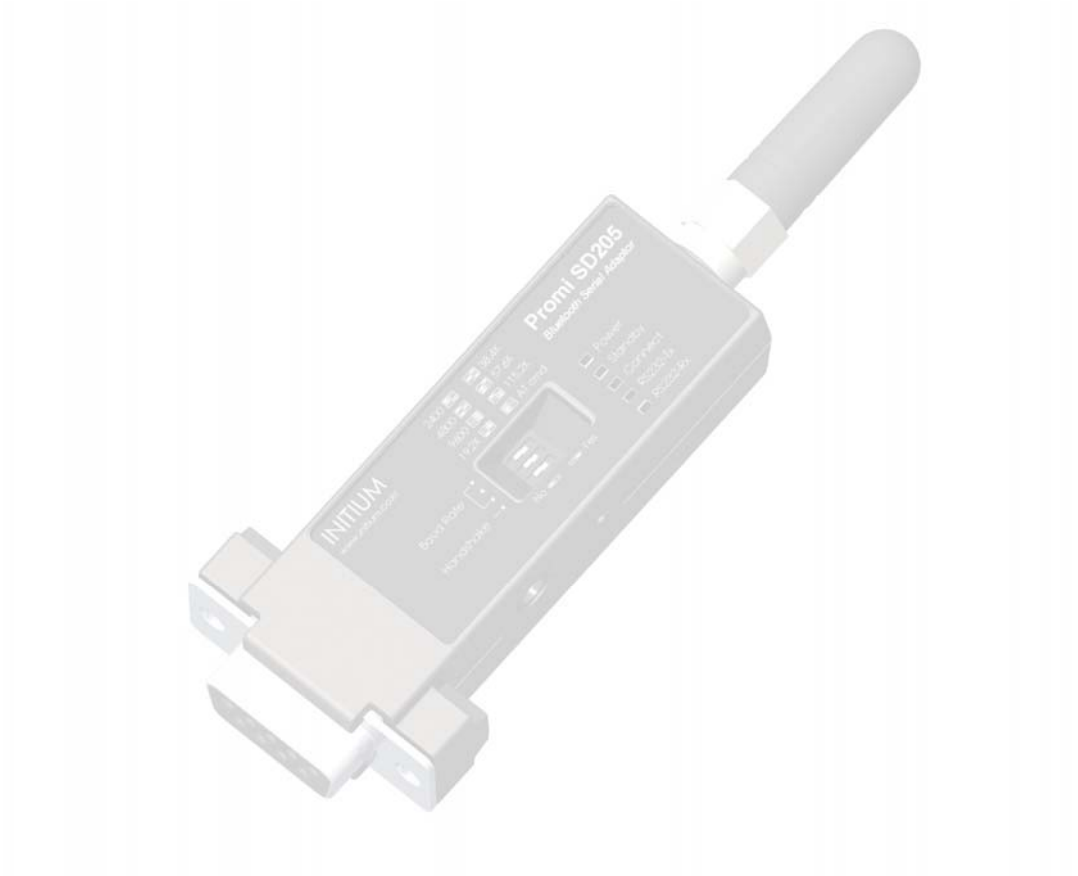
Before Using the Product

- **Welcome**
- **Copyrights/Certification/Limited Liability**
- **Precautions and Safety**
- **General Terms and Conditions of Sale**



get **UNWIRED**, it's easy!

Welcome

Thank you for purchasing Promi-SD products.

Promi-SD is a terminal device for wireless serial communication using Bluetooth technology, the international standard for short range wireless communications. Its interoperability and credibility delivers the maximum benefits of wireless communication.

This user manual is designed to help you use the Promi-SD series properly. It is important that you read the manual to ensure that you get the most out of your products.

Thank you.

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↘ Certification

Promi-	MIC	Bluetooth	CE	FCC	TELEC
SD101	O	O	O	O	O
SD202	O	O	O	O	O
SD205	O		O	O	

↘ Limited Liability

Neither the manufacturer, importers nor dealers is responsible for any accidental damage including bodily injury or any damage resulting from misuse or unsuitable operation by you. The information on this manual is prepared with the current product specifications. The manufacturer, Initium Co., Ltd., is adding new features to the product and may persistently apply new technologies hereafter. All standards may be changed at any time without notice.

Precautions and Safety

↘ Electricity

- Use only the supplied AC adapter. Use of unauthorized power adapter is not recommended. Electrical shock may result.
- Do not kink or crease the power cable or place heavy objects on the power cable. Fire can result from damaged power cables.
- Do not handle power plug and adapter with wet hands. Electrical shock may result.
- Immediately power off the product and unplug the AC adapter if smoke or odors emit from the product and adapter. Fire can result from improper use.
- Immediately power off the product and unplug the AC adapter if water or other liquids are present. Fire can result from improper use.

↘ Product

- Promi-SD meets the RS-232 standards. Do not wire with non-standard products. Damage to your products may result from improper use.
- Do not drop or subject the device to impact. Damage to your products may result from improper use.
- Keep away from harsh environments including humid, dusty, and smoky areas. Damage to your products may result from improper use.
- Do not use excessive force on the buttons or attempt to disassemble the device. Damage to your products may result from improper use.
- Do not place heavy objects on the product. Damage to your products may result from improper use.

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1. GENERAL. These general terms and conditions of sale (along with any associated written specification, quotation and/or supplemental terms and conditions provided by Seller) exclusively will govern the sale or licensing by Seller of all goods and services (including without limitation, hardware, firmware and software products, training, programming, maintenance, engineering, parts, repair and remanufacturing services – hereinafter, "Products") furnished to Buyer hereunder, whether such sale or licensing is effected by paper-based transactions or via facsimile or other forms of electronic data interchange or electronic commerce, and represents the entire agreement between Buyer and Seller with respect thereto. Buyer's receipt or acceptance of delivery of any of the Products ordered or purchased hereunder will constitute its acceptance of these terms and conditions. No addition or modification to these terms and conditions will be binding on Seller unless agreed to in writing signed by an authorized representative at Seller's headquarters. Seller objects to and rejects other terms and conditions that may be proposed by Buyer or that appear on or are referenced in Buyer's purchase order or requisition that are in addition to or otherwise not consistent with the terms and conditions set forth or referenced herein.
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14. DISPUTES. The parties will attempt in good faith promptly to resolve any dispute arising hereunder by negotiations between representatives of the parties who have authority to settle the dispute. If unsuccessful, the parties further will attempt in good faith to settle the dispute by non-binding third-party mediation, with mediator fees and expenses apportioned equally to each side. Any dispute not so resolved by negotiation or mediation may then be submitted to a court of competent jurisdiction in accordance with the terms hereof. These procedures are the exclusive procedures for the resolution of all such disputes between the parties.

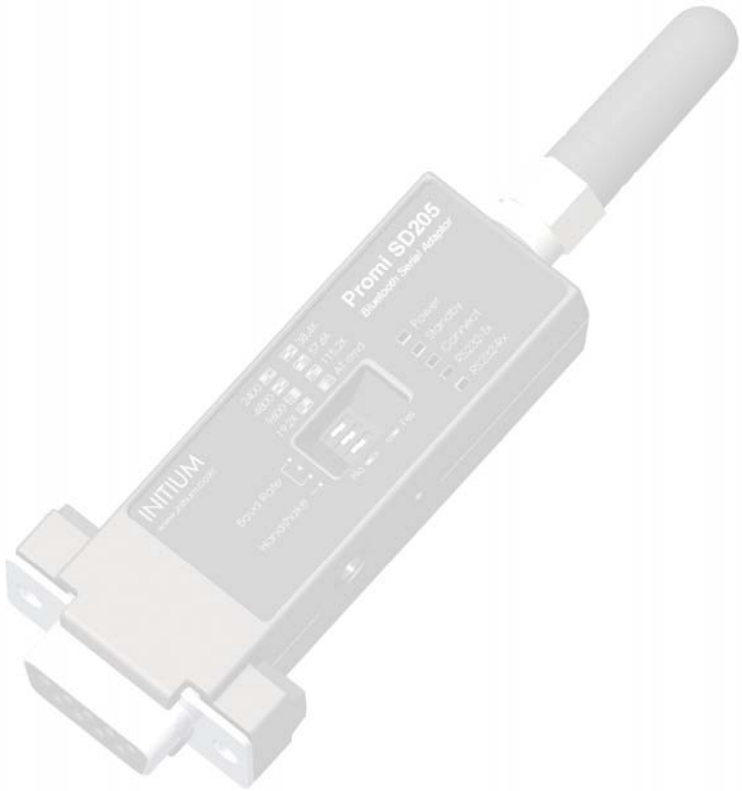
15. GOVERNING LAW AND FORUM. The agreement evidenced hereby and all disputes arising thereunder will be governed by and interpreted in accordance with the internal laws and will be subject to the exclusive jurisdiction of the courts of the state, province or other governmental jurisdiction in which Seller's principal place of business resides, but specifically excluding the provisions of the 1980 UN Convention on Contracts for the International Sales of Goods. Should any term or provision hereof be held wholly or partly invalid or unenforceable under applicable law, the remainder of the agreement evidenced hereby will not be affected thereby.

16. ASSIGNMENT. The agreement evidenced hereby may not be assigned by either party without the written consent of the other (which consent will not be unreasonably withheld). However, consent will not be required for internal transfers and assignments as between Seller and its parent company, subsidiaries or affiliates as part of a consolidation, merger or any other form of corporate reorganization.

17. LANGUAGE. The parties acknowledge that they have required that the agreement evidenced hereby be drawn up in English. Les parties reconnaissent avoir exigé la rédaction en anglais du Contrat. In the event of a conflict between the English and other language versions, the English version will prevail.

1. Getting Started

- **Features of Promi-SD**
- **Components**
- **Assembly**
- **Locating the Controls**



get **UNWIRED**, it's easy!

Features of Promi–SD

↘ Reliability and Interoperability

Promi-SD is a terminal device for wireless serial communication using the Bluetooth technology that is international standard of short range wireless communications. Promi-SD accomplishes more reliable wireless communication. As Promi-SD can communicate with other Bluetooth devices, user may construct various communications with it.

Promi-SD provides several models with different communication ranges from 30m (Promi-SD101) up to 100m (Promi-SD202, 205) for user's various applications. In terms of noise, Promi-SD delivers better quality of communication than standard RS232 cables.

↘ Compact Design

Promi-SD has the most compact design of the same kind devices and can be placed conveniently into any devices or equipments. Its detachable antenna of variety optimizes the quality and distance of wireless communications.

↘ Easy Configuration and Adaptation

Promi-SD can be configured and controlled by typical AT commands. User can easily configure Promi-SD on the terminal program such as HyperTerminal and implements the wireless communication without modifying user's existing serial communication program. In addition to the basic AT commands, Promi-SD provides some expanded AT commands for its various functions.

User friendly PromiWizard and PromiWIN are also provided for easy setup on Microsoft Windows.

For Promi-SD205, user can setup the serial port parameters by dip switch without PC.

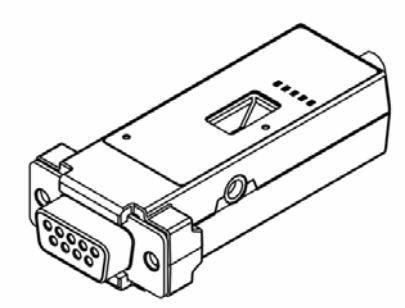
↘ Security

The FHSS (Frequency Hopping Spread Spectrum) technique of Bluetooth lets Promi-SD have less radio interference and no danger of hacking in air. Promi-SD also supports authentication and data encryption.

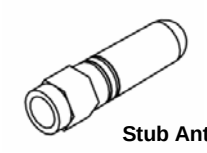
↘ Benefits

- No cable installation
- Free from the environmental limitations
- Easy relocation
- Simple maintenance

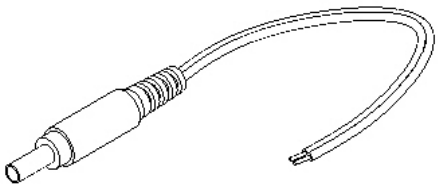
Components



Promi-SD101/SD202/SD205



Stub Antenna

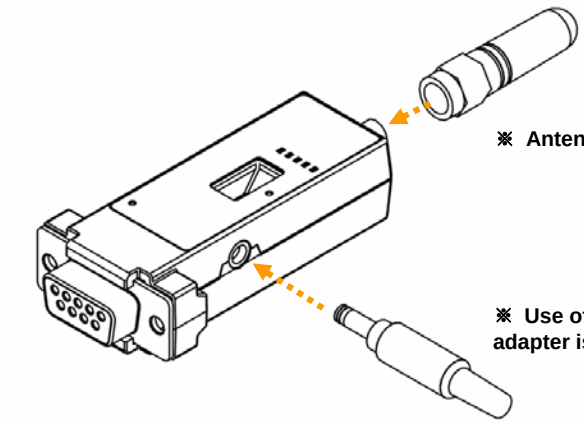


DC 5V Power Cable

Fig.1-1 Components of Promi-SD

Please check the components of Promi-SD in Fig. 1-1 when purchasing. The picture of product may differ by models. The components of the package may change for improving product capacity or quality without notice.

Assembly

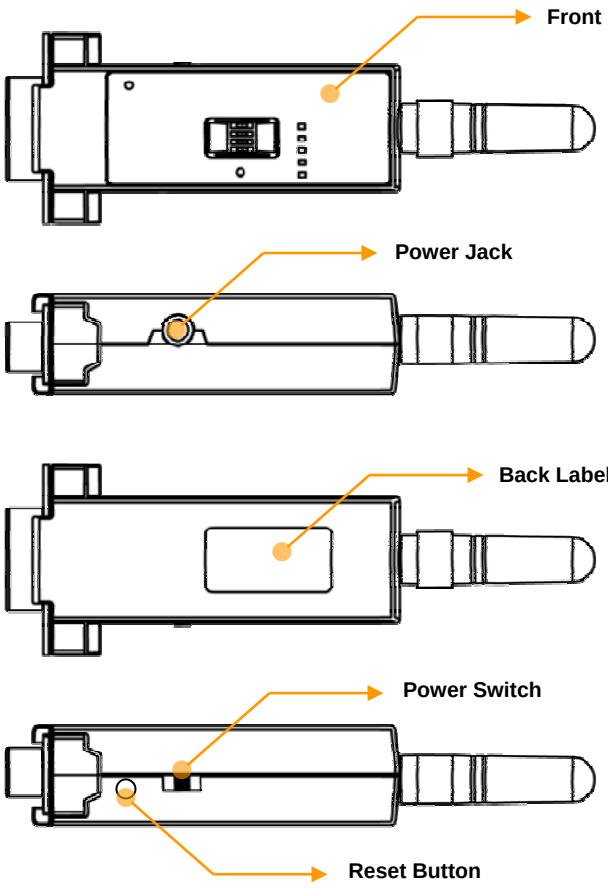


※ Antenna is left-hand threaded.

※ Use of non-authorized power adapter is not recommended.

Fig.1-2 Assembly of Promi-SD

Locating the Controls

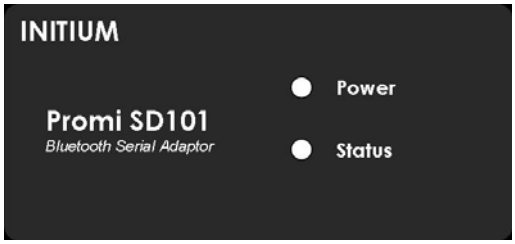


※ SD101/SD202 has reset button on side. SD205 has it on front.

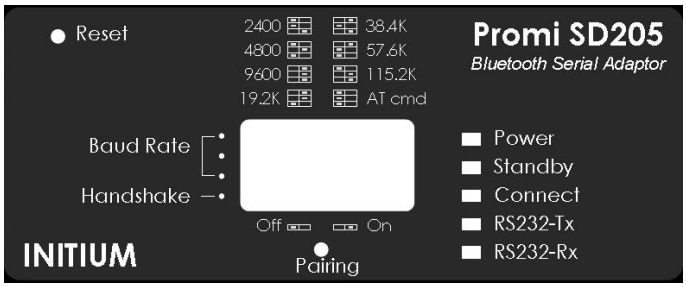
Fig.1-3 Locating the Controls

↘ Front Panel †

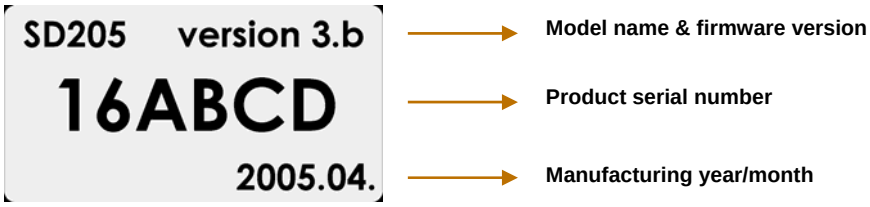
- Promi-SD101/SD202



- Promi-SD205

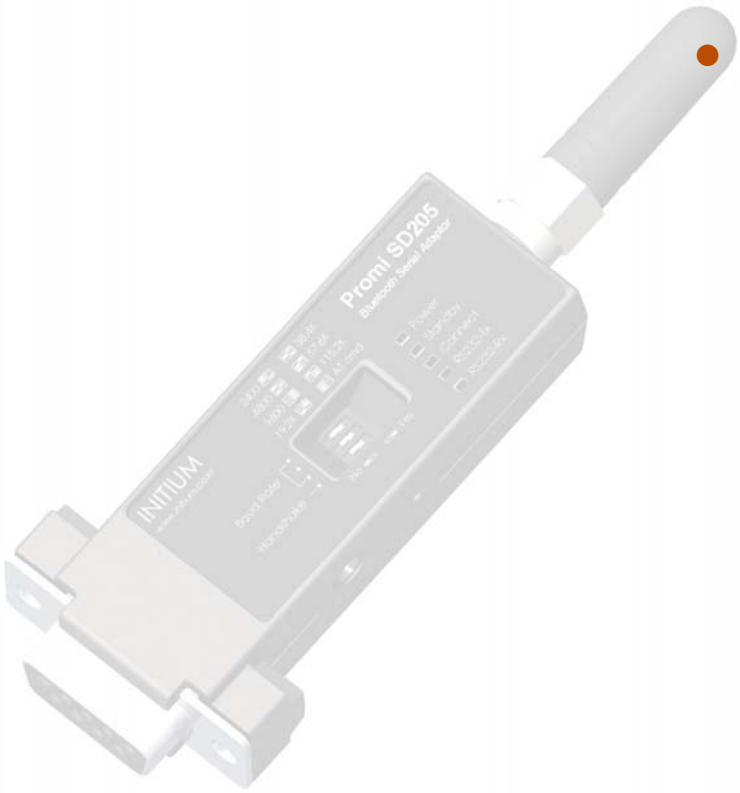


↘ Back Label †



2. Configurations

- Operation Modes
- LED Indicators
- Serial Ports
- Reset to Factory Defaults
- PromiWizard™
- PromiWIN™
- Terminal Program
- Dip Switch
- Pairing Button



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Operation Modes

In addition to the serial port configurations such as bit/second, data bit, parity, stop bit, flow control, Promi-SD has some configurations for Bluetooth. For getting the most out of Promi-SD, user should understand the following Bluetooth connection schemes.

A Bluetooth device can play a role as a master or slave. Master tries to connect itself to other Bluetooth device, and slave is waiting to be connected from other Bluetooth devices. A Bluetooth connection is always made by a pair of master and slave. A slave can be in two modes, Inquiry Scan or Page Scan mode. Inquiry Scan mode is waiting the packet of inquiry from other Bluetooth devices and Page Scan mode is waiting the packet of connection from other Bluetooth devices. Every Bluetooth device has its unique address, called BD (Bluetooth Device) address, which is composed of 12 hexa-decimal numbers.

Promi-SD has 4 operation modes as follows. Each mode can be identified with LED indicators as illustrated in next section.

↘ Mode0

Promi-SD must be in Mode0, when it is directly controlled by AT commands.

In this mode, there is no response when power on or software reset, and Promi-SD is just waiting for AT command input. Neither master nor slave is assigned to Promi-SD in mode0. User can change the configurations of Promi-SD in this mode.

The factory default is set to Mode0.

↘ Mode1

Promi-SD tries to connect the last connected Bluetooth device.

Promi-SD in Mode1 is to be a master and tries to connect the last connected Bluetooth device. Promi-SD always stores the BD address of the Bluetooth device to which Promi-SD has connected last time. When Promi-SD is initially used or after hardware reset, there is no BD address stored in Promi-SD. In this case, Mode1 does not make any sense and mode change from other operation modes to Mode1 is not allowed. The mode change to Mode1 can be made after Promi-SD succeeds to connect to other Bluetooth device in Mode0. Once changed to Mode1, Promi-SD will try to connect automatically the last connected Bluetooth device whenever power on or software reset.

Promi-SD in Mode1 cannot be discovered or connected by other Bluetooth devices.

↘ Mode2

Promi-SD is waiting for the connection from the last connected Bluetooth device.

Promi-SD in Mode2 is to be a slave and waiting for the connection only from the last connected Bluetooth device. Just like Mode1, if there is no BD address stored in Promi-SD, the mode change from other operation modes to Mode2 is not allowed. Once changed to Mode2, Promi-SD will wait for the connection from the last connected Bluetooth device whenever power on or software reset.

Promi-SD in Mode2 cannot be discovered or connected to Bluetooth devices other than the last connected device.

↘ Mode3

Promi-SD is waiting for the connection from any other Bluetooth devices.

Promi-SD in Mode3 acts like in Mode2, but allows any connection from other Bluetooth device. Most of general Bluetooth device is set to Mode3.

Promi-SD in Mode3 can be discovered and connected from any other Bluetooth devices.

LED Indicators

↘ Promi-SD101/SD202

Indicator	Power LED	Status LED
Mode0	Green ┌────	Red ┌────
Mode1	Green ┌────	Green (every 1 sec) ┌┐
Mode2	Green ┌────	Green (every 3 sec) ┌┐┌┐
Mode3	Green ┌────	Green (every 3 sec) ┌┐┌┐
Connected	Green ┌────	Green ┌────

↘ Promi-SD205

Indicator	Power LED	Standby LED	Connect LED
Mode0	Green ┌────	Red ┌────	
Mode1	Green ┌────		Green (every 1 sec) ┌┐
Mode2	Green ┌────		Green (every 3 sec) ┌┐┌┐
Mode3	Green ┌────		Green (every 3 sec) ┌┐┌┐
Connected	Green ┌────		Green ┌────

RS232-Tx and RS232-Rx LED are blinking accordingly when data is transmitted. For small data transmission, it may be hard to recognize the quick blinking.

Serial Ports

The applicable settings for serial ports are as follows.

Serial Port Settings	Values
Baud rate	1200, 2400, 4800, [9600], 19200, 38400, 57600, 115200, 230400
Data bit	[8]
Parity	[No parity], Even parity, Odd parity
Stop bit	[1], 2
Hardware Flow Control	[Use], No use

The values in box are the factory defaults.

↘ Data Bit

Promi-SD supports only 8 data bit. In the case of 7 data bit, please contact the technical support.

↘ Hardware Flow Control

Promi-SD plugged into its host system transmits data from host to the other side Bluetooth device. These data is saved temporarily in the internal buffer of Promi-SD and sent repeatedly until the transmission is completed packet by packet. When the radio transmission condition is not good enough to send data promptly, it can cause the transmission delay. If the host sends more data when the buffer is full, buffer overflow will make Promi-SD malfunction consequently. In order to prevent this buffer overflow, Promi-SD works as follows.

In case of using hardware flow control, Promi-SD makes RTS be 'disable' to stop receiving further data from the host when the buffer becomes full. RTS will be 'able' to begin receiving data again from the host when the buffer has some room for more data.

In case of not using hardware flow control, Promi-SD clears the buffer to secure the room for next data when the buffer becomes full. This means the loss of data. As the transmission data becomes large, the possibility of data loss goes higher.

For large data transmission, use of hardware flow control is highly recommended.

Reset to Factory Defaults

To turn back all the configurations to its factory settings, press the reset button depicted in Fig. 1-3. Press the reset button with a narrow pointed tool like paper clip longer than 1 second. Reset works only when power is on.

Configuration Software

Configuration Software	Usage	Operating Platform
PromiWizard	Automatic connection of a pair of Promi-SD's	MS Windows 98SE or higher
PromiWIN	Individual setup of Promi-SD	MS Windows 98SE or higher

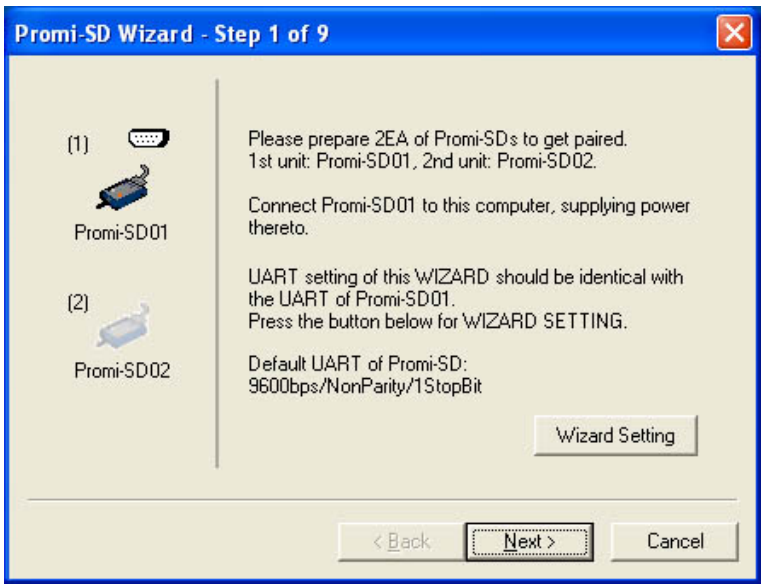
This configuration software comes with the product, which also can be downloaded from http://www.initium.co.kr.

PromiWizard

PromiWizard is a Wizard program for the configuration of a pair of Promi-SD's to make automatic connection between them afterwards. To make connection with Bluetooth devices other than Promi-SD, use PromiWIN or AT commands on a terminal program.

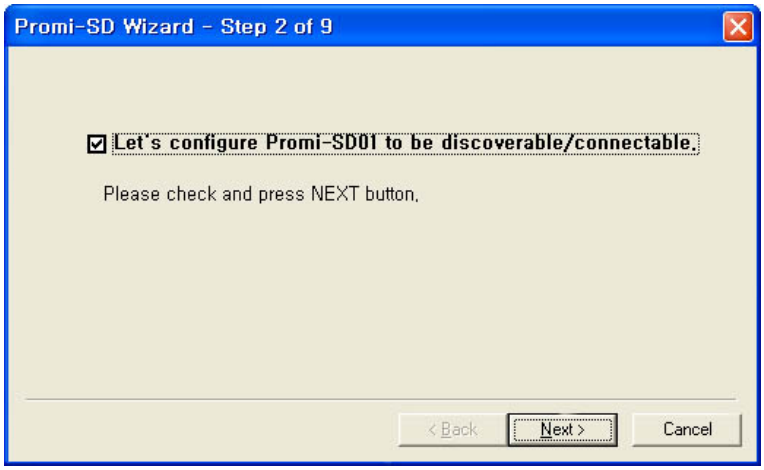
For convenience sake, we call two Promi-SD's SD1 and SD2 respectively.

Install and run PromiWizard.



Plug SD1 into the serial port of host computer and power on. Status (Promi-SD101/202) or Standby (Promi-SD205) LED will be lit in red. It may be blinking in green if SD1 has different settings from factory defaults.

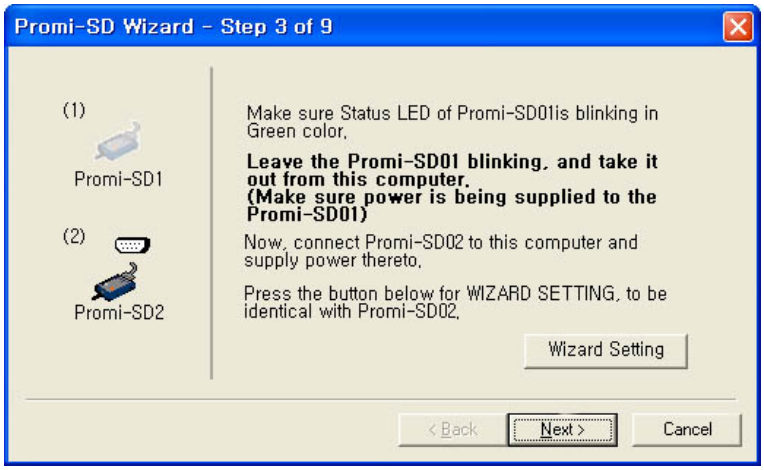
Click [Wizard Setting] button to configure the serial port settings of SD1. These settings must be same as those of the host system, to which SD1 is used. Click [Next], then Status (Promi-SD101/202) or Standby (Promi-SD205) LED will be lit in red.



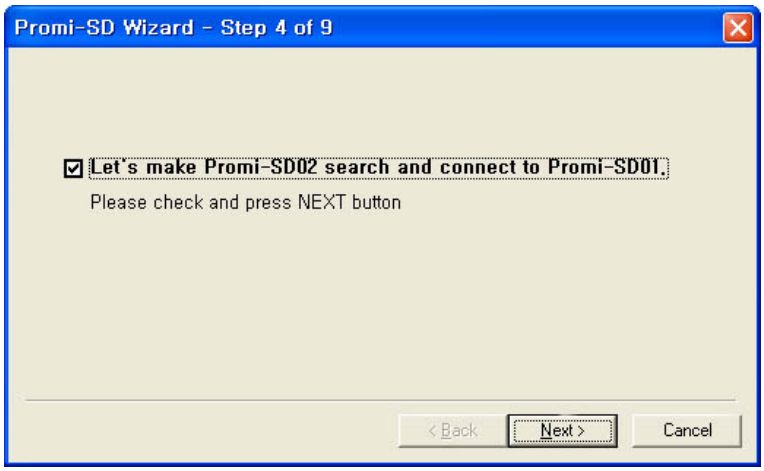
Click [Next] with marking in the check box. SD1 becomes in Scan mode, in which SD1 can be discovered and connected from other Bluetooth device. Status (Promi-SD101/202) or Standby (Promi-SD205) LED will blink twice in green every 3 seconds.

Take SD2 out of the host computer. Be careful to keep the power on.

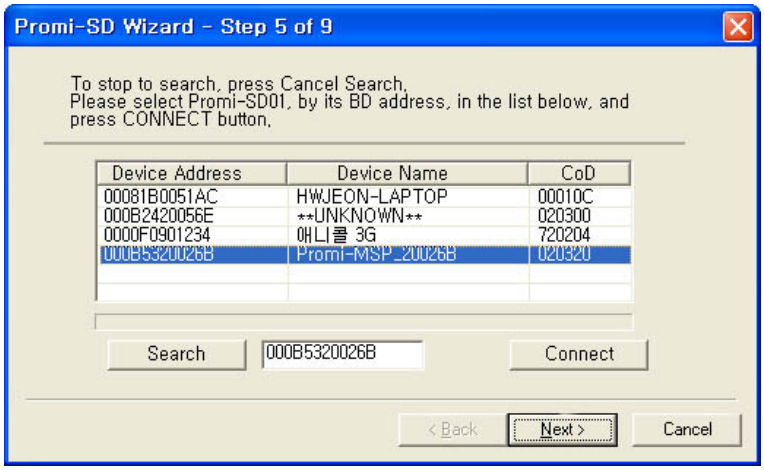
Now, plug SD2 into the serial port of the host computer and power on.



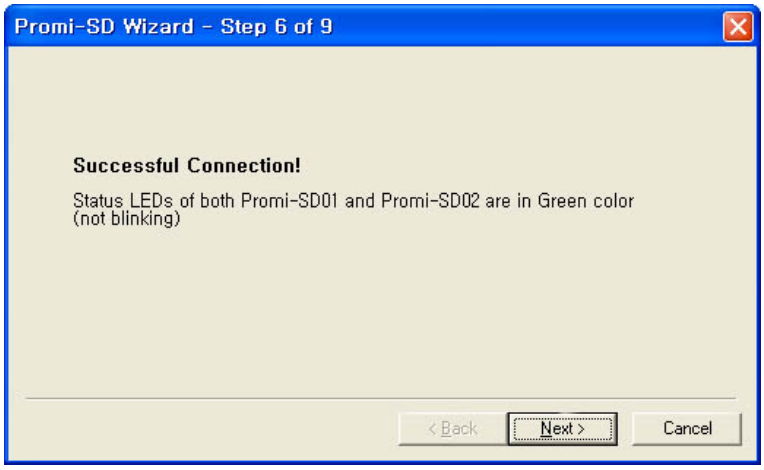
Click [Wizard Setting] button to configure the serial settings of SD2. These settings must be same as those of the host system, to which SD2 is used. Click [Next], then Status (Promi-SD101/202) or Standby (Promi-SD205) LED will be lit in red.



Click [Next] with marking in the check box. Status (Promi-SD101/202) or Standby (Promi-SD205) LED will blink in green. SD2 begins to search nearby Bluetooth devices for 30 seconds. The program will show the Bluetooth devices with Device Address, Device Name and CoD (Class of Device).

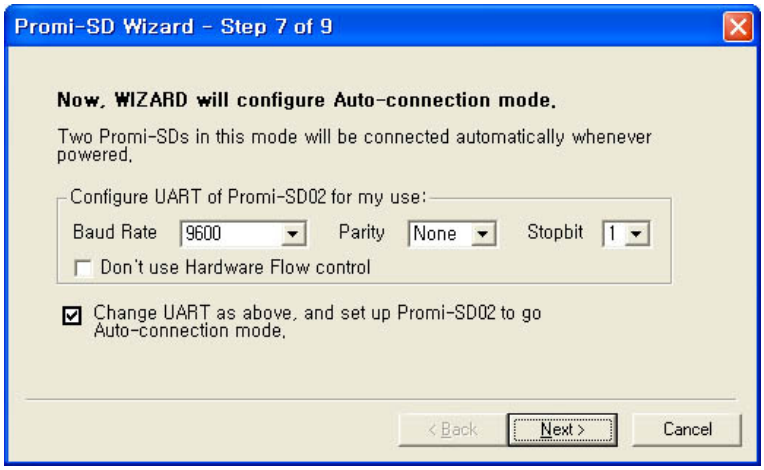


Select SD1 and click [Connect], then the following message box will be shown.

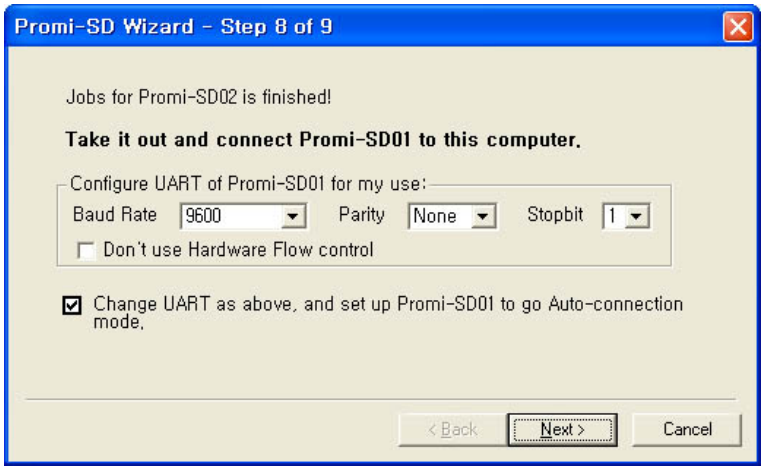


It takes about 5 seconds to complete connection. SD1 and SD2 now have each other's BD address. Status (Promi-SD101/202) or Standby (Promi-SD205) LED's of both SD1 and SD2 will be lit in green.

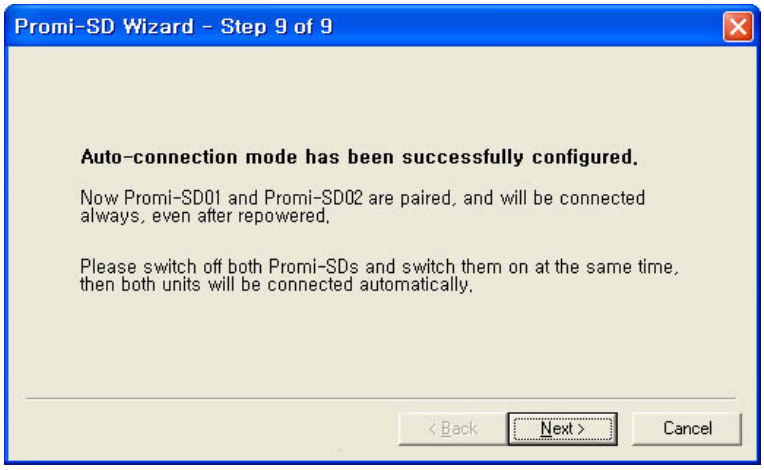
For the automatic connection between SD1 and SD2 when power off and on, operation mode of SD1 and SD2 have to be set respectively.



Set the operation mode of SD2 to Mode1. SD2 is working as a master trying to connect itself to SD1.



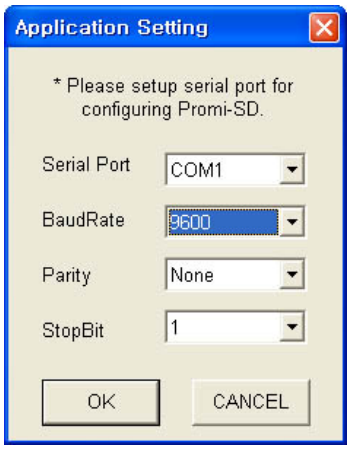
Take SD2 out of the host computer and plug SD1 into the serial port again. Set the operation mode of SD1 to Mode2. SD1 is working as a slave waiting for the connection from SD2.



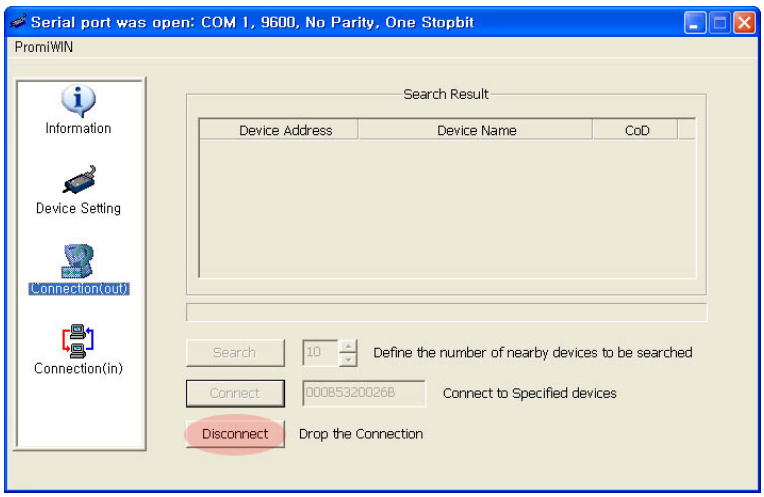
Now the configuration of SD1 and SD2 has been completed. When power off and on both of them, they will make connection again automatically.

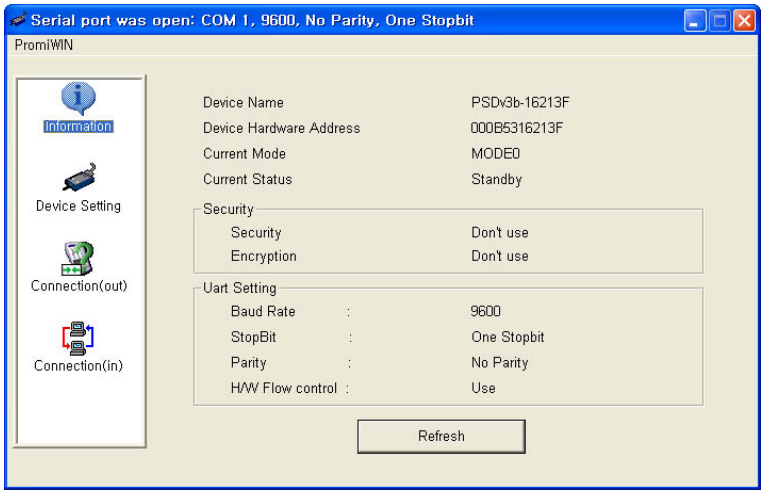
PromiWIN

PromiWIN is a program running on Microsoft Windows for the configuration of Promi-SD. Install PromiWIN on your computer. Plug a Promi-SD into the serial port of the computer and turn on the power. Run PromiWIN.



Set each option properly and click [Confirm]. If the settings are different from the host computer, error message will pop up. If the Promi-SD is in the status of connection, warning message will pop up. Then the current connection can be cancelled by [연결 해제] button on the main window.

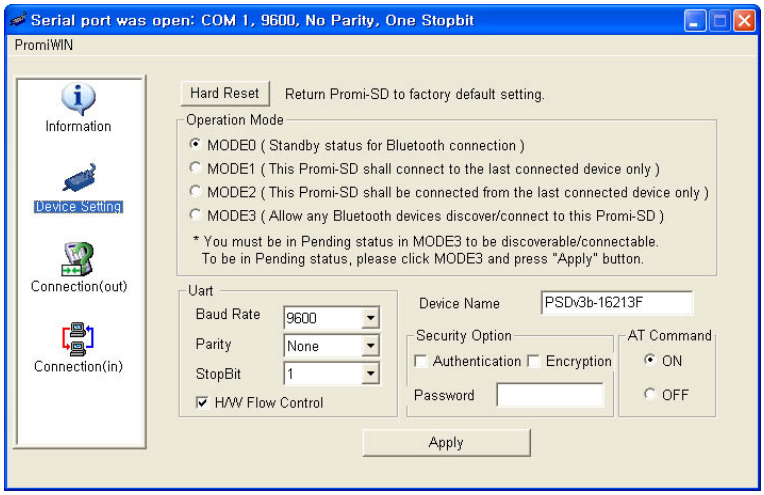




Serial port settings can be changed by <Start Configuration> and <PromiWIN Configuration> of PromiWIN in the menu bar at upper left corner of the window without re-running the PromiWIN program.

The icons in the left side window come to the corresponding windows.

In device configuration window, hardware reset can be executed or operation mode and RS232 can be configured as well. Security option also can be configured in this window.

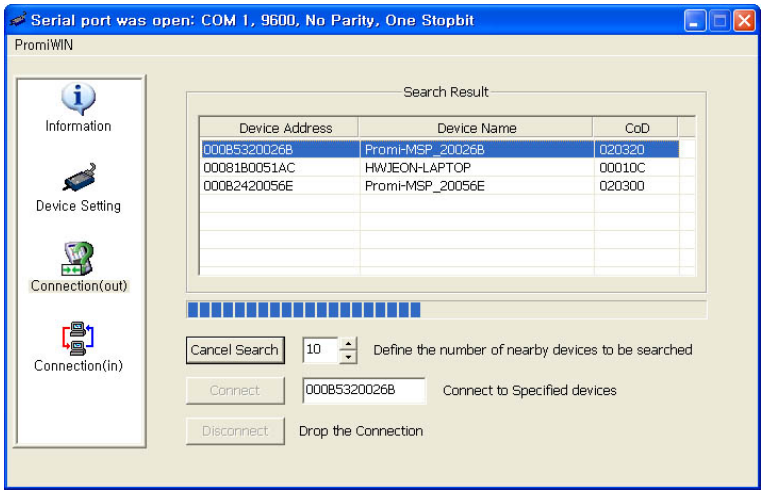


Promi-SD has 4 response messages, 'OK', 'ERROR', 'CONNECT', and 'DISCONNECT'. In some cases, these responses can affect the host system unexpectedly. To prevent this, user can set the response to ON or OFF.

For Promi-SD205, hardware flow control can be configured only by dip switch. Thus H/W Flow Control option will not work in this case.

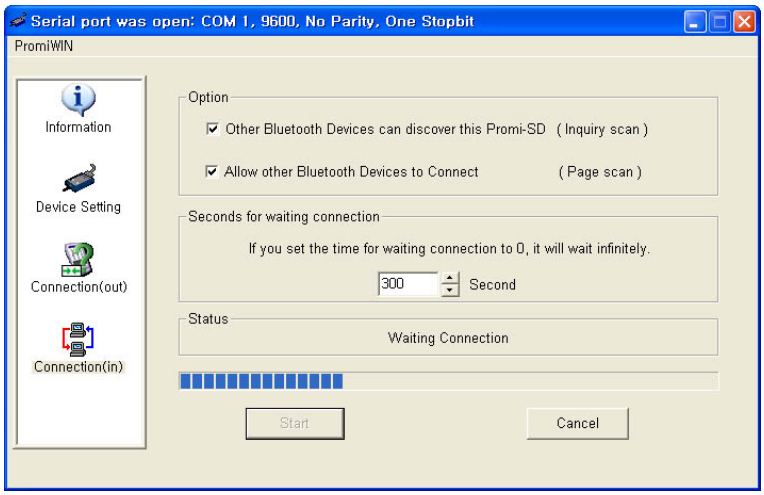
Click [Apply] button to reflect the given options to Promi-SD actually.

Connect icon will show the following window to search and connect other Bluetooth devices.



Click [Search] button to search nearby Bluetooth devices. The maximum number of devices to be searched can be controlled. Select one of the devices searched and click [Connect] button. The selected Bluetooth device must be in Page scan mode. Click [연결 해제] button to cancel the connection normally.

Connection(in) icon will show the following window to make Promi-SD wait to a connection from the other Bluetooth device. The waiting time in seconds can be controlled. With 0 input for this waiting time, Promi-SD keeps waiting for connection until [Cancel] button is clicked.



Terminal Program

A terminal program is an application that will enable a PC to communicate directly with a modem. If you are using Windows 98SE or higher version of Windows, HyperTerminal program as it is included as part of the operating system. Promi-SD provides some extended AT commands for its configurations on terminal program.

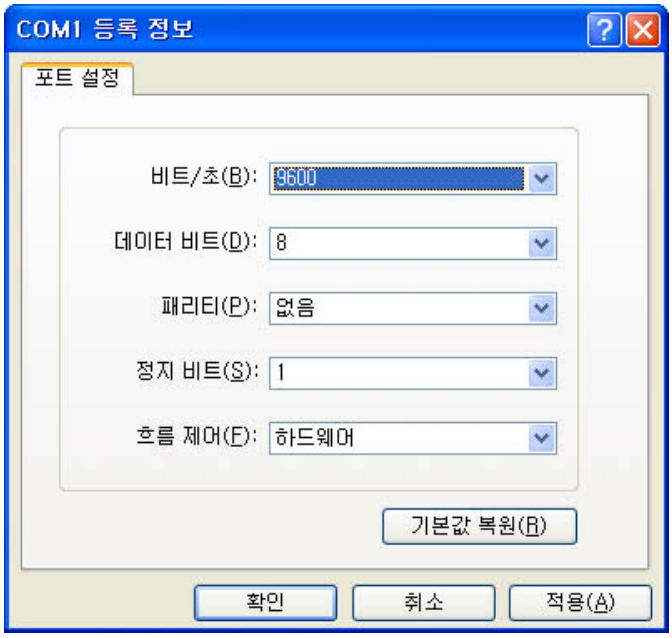
This manual will explain the method using HyperTerminal. If you need to install HyperTerminal, click start>setting>control panel>add/remove programs. For more precise information, please refer to Help of Microsoft Windows.

Attach Promi-SD to serial port of host computer and power on. Check Status LED (Promi-SD101/202) or Standby LED (Promi-SD205) is lit in green.

Launch HyperTerminal. It can be found in start >programs >accessories >communication >HyperTerminal. Select the Serial port that Promi-SD will be connected to.

Input the same settings into Serial port configuration window as Promi-SD settings.

The settings need to be set correctly, otherwise, error message may be shown up on the screen or cause malfunctioning of Promi-SD.



Choose the settings in File->Properties->Settings->ASCII setup that let you turn echo on in HyperTerminal; this will show the response Promi-SD sends on the screen.

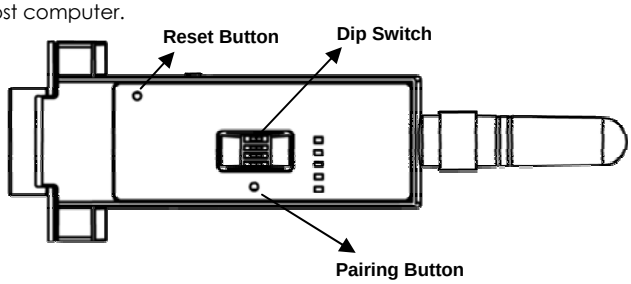
You now get the HyperTerminal window where you are able to control Promi-SD with AT commands. For expanded AT commands that Promi-SD provides, please refer to Appendix A. AT commands.

Example of AT commands:

```
AT+BTINFO?
000B53000509,PSDv2a-000509,MODE0,STANDBY,0,0,HWFC

OK
AT+BTINQ?
000B5320007E,PSDv2a-20007E,001F00

0004B300E205,AP2002:1 #0,020300

OK
ATD000B53000509
OK

CONNECT 000B53000509
```

Dip Switch (Promi-SD205 only)

This feature is only on Promi-SD205. With the combination of 4 slot dip switches, baud rate and hardware flow control can be set simply without host computer.



Upper 3 dip switches are used for setting baud rate, and bottom dip switch is used for setting hardware flow control option. If the baud rate needs to be set out of the range given below, PromiWIN or terminal program should be used for extended AT commands. At this time combination of dip switches must be complied with AT cmd. Then baud rate will go back to 9600 as default.

Baud Rate	2400	4800	9600	19.2K	38.4K	57.6K	115.2K	AT cmd
								

Hardware Flow Control Handshaking	No use	Use
		

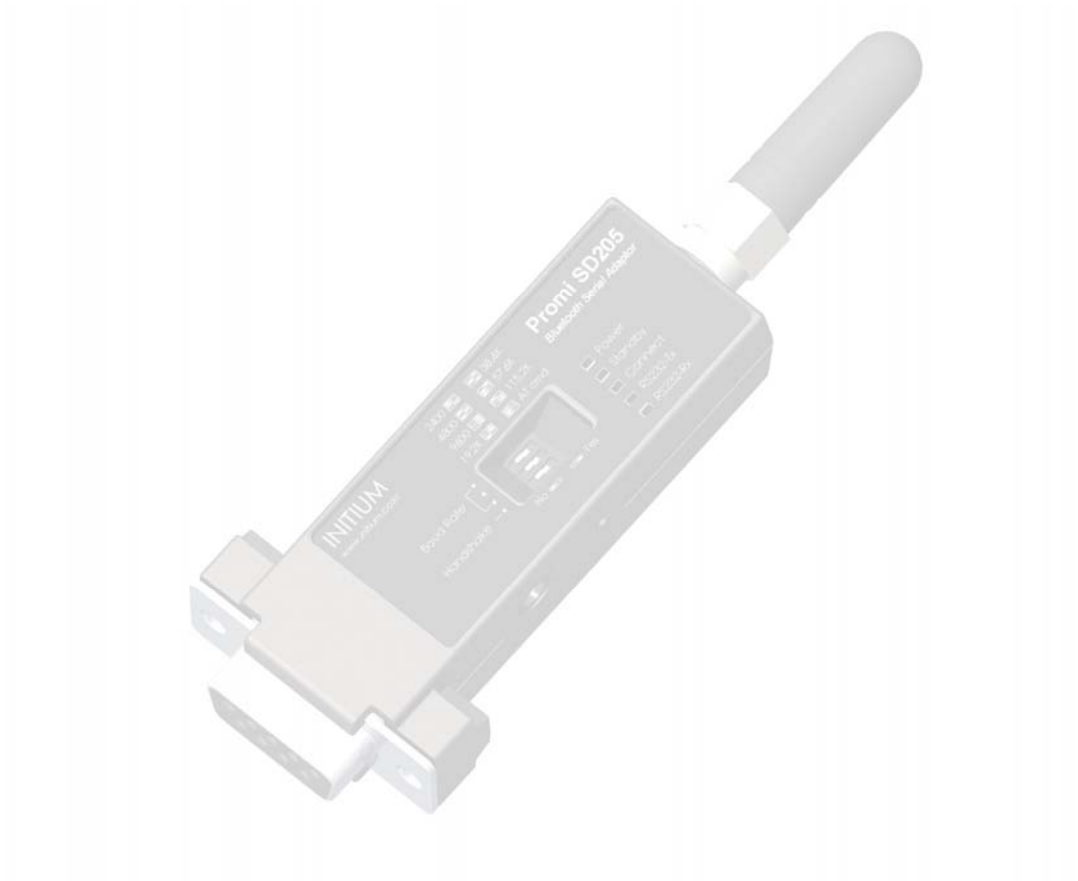
Pairing Button (Promi-SD205 only)

Promi-SD205 provides Pairing Button for instant configuration without PC to make an automatic connection between two Promi-SD205s. For convenience sake, name two Promi-SD205s as SD1 and SD2 respectively.

1. Turn off all the nearby Promi-SD/ESD.
2. Turn on SD1 and SD2 and hardware reset both of them by pressing Reset Button.
3. Press the Pairing Button of SD1 for 2 seconds until Standby LED of SD1 blinks 3 times every 3 seconds. Keep the power ON.
4. Press the Pairing Button of SD2 for 2 seconds until Standby LED turns off and Connect LED blinks 3 times every 2 seconds. Now press again the Pairing Button for 2 seconds until Connect LED blinks every 0.5 second.
5. Wait for SD1 & SD2 to be connected for a while until Connect LED's of SD1 and SD2 is lit in green. It takes about 30 seconds to make a connection. If there are many Bluetooth devices nearby, it will take a little bit more.
6. Turn SD1 off and on. Connect LED blinks twice in green every 3 seconds.
7. Turn SD2 off and on. Connect LED blinks once in green every 1 second.
8. Now a pair of Promi-SD205 is configured to make automatic connection, whenever power off and on.
9. Just use this pair of Promi-SD205 like virtual serial cable.

3. Connections

- **RS232 Interface**
- **Pin Assignment**
- **Power Supply**



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RS232C Interface

↘ RS232C

In the early 1960s, a standards committee, today known as the Electronic Industries Association, developed a common interface standard for data communications equipment. At that time, data communications was thought to mean digital data exchange between a centrally located mainframe computer and a remote computer terminal, or possibly between two terminals without a computer involved. These devices were linked by telephone voice lines, and consequently required a modem at each end for signal translation. While simple in concept, the many opportunities for data error that occur when transmitting data through an analog channel require a relatively complex design. It was thought that a standard was needed first to ensure reliable communication, and second to enable the interconnection of equipment produced by different manufacturers, thereby fostering the benefits of mass production and competition. From these ideas, the RS232 standard was born. It specified signal voltages, signal timing, signal function, a protocol for information exchange, and mechanical connectors. Refer the following site for details;

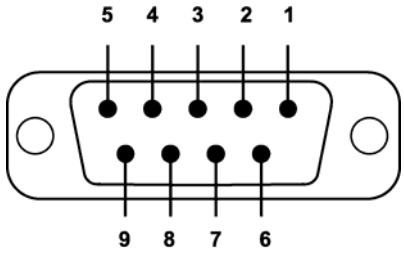
http://www.camiresearch.com/Data_Com_Basics/RS232_standard.html

↘ DTE/DCE

If the full EIA232 standard is implemented as defined, the equipment at the far end of the connection is named the DTE device (Data Terminal Equipment, usually a computer or terminal), has a male DB9 connector. Equipment at the near end of the connection (the telephone line interface) is named the DCE device (Data Circuit-terminating Equipment, usually a modem), has a female DB9 connector. The cable linking DTE and DCE devices is a parallel straight-through cable with no cross-overs or self-connects in the connector hoods. If all devices exactly followed this standard, all cables would be identical, and there would be no chance that an incorrectly wired cable could be used.

↘ DB9 Female

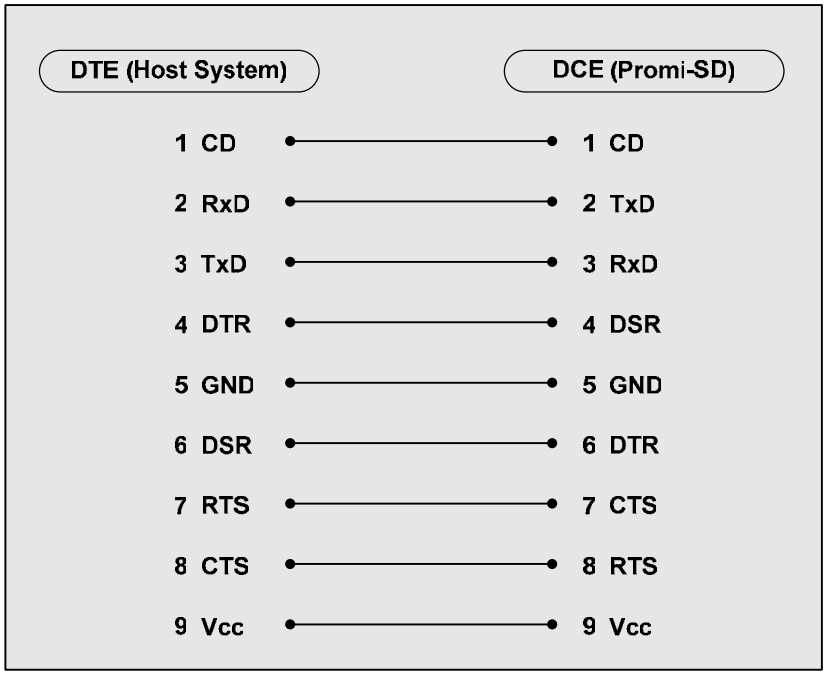
Promi-SD is a DCE device compatible with RS232 standard, having DB9 female interface.



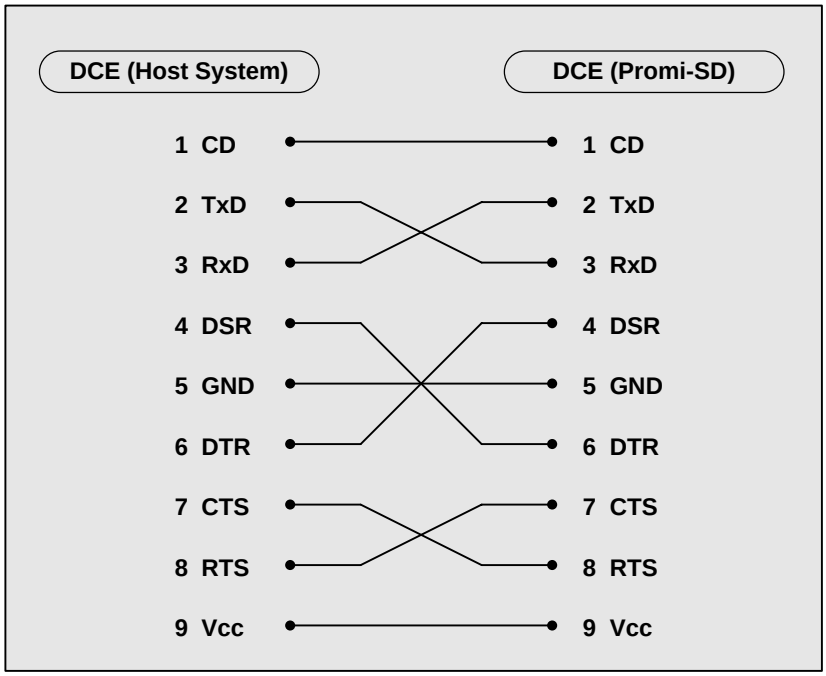
Pin #	Signal	Direction	Description
1	CD	Output	Received Line Signal Detect
2	TxD	Output	Transmitted Data
3	RxD	Input	Received Data
4	DSR	Input	DTE Ready
5	GND	-	Signal Ground
6	DTR	Output	DCE Ready
7	CTS	Input	Clear to Send
8	RTS	Output	Request to Send
9	Vcc	Input	Ring Indicator

Pin Assignment

↘ **To Host with DTE Interface**



↘ **To Host with DCE Interface**

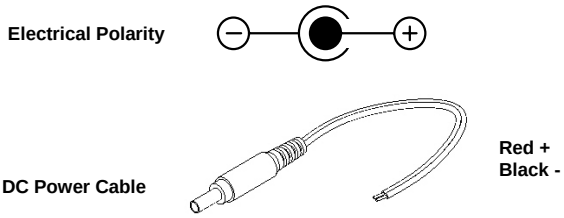


Power Supply

Promi-SD can be supplied power through the power jack and through pin 9 of DB9 connector.

↘ Through Power Jack

DC 5 ~ 12V, Min. 150mA power should be supplied through DC power cable. Red cable is positive and black one is negative.



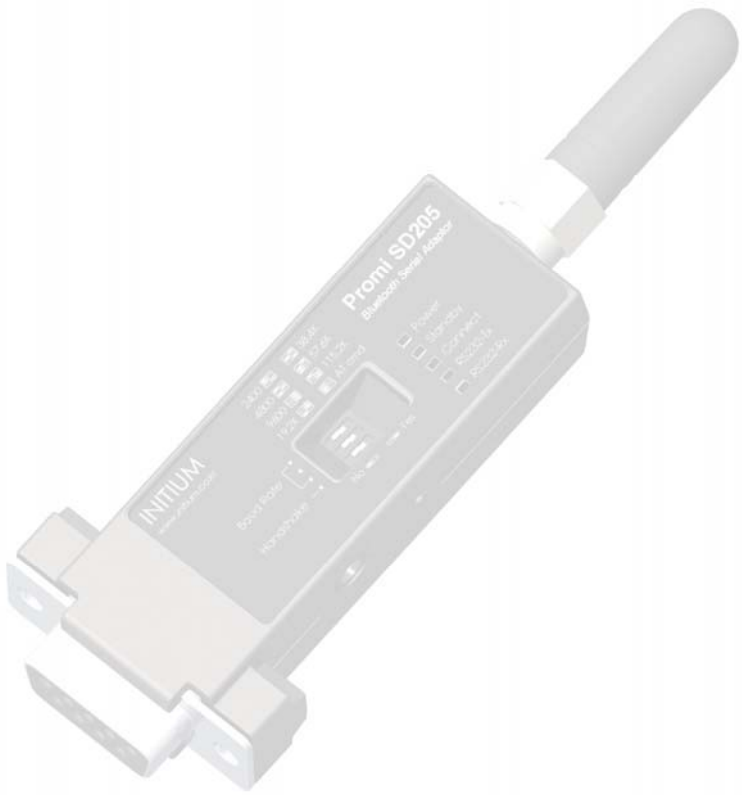
AC/DC power adaptor and USB power cable are also available to supply power.

↘ Through Pin 9 of DB9 connector

The power can be supplied through pin 9 of DB9 connector. Because Promi-SD does not have any protection circuit from surge, it must be constant voltage of 5 ~ 12V.

4. Trouble Shooting

- **No Data Transmission**
- **Data Loss or Malfunctioning**
- **Transmission Delay**



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No Data Transmission

↘ COM Port Settings

Check whether the Baud rate of Promi-SD is same as that of its host equipment. If you do not know the current Baud rate of Promi-SD, initialize it to 9600 by pressing Reset Button.

Check whether the Data bit is set to 8. Promi-SD supports only 8 Data bit. If your host equipment uses 7 Data bit and even or odd parity, it can work as if it uses 8 Data bit and No parity. This is valid only when both DCE devices are Promi-SD. In this case, set both Promi-SDs to 8 Data bit and No parity. If one of DCE devices is other Bluetooth device such as Bluetooth USB dongle, please contact Technical Support.

Check whether the Parity and Stop bit of Promi-SD are same as those of its host equipment. Promi-SD supports No parity, Even parity and Odd parity, 1 and 2 Stop bit.

Check whether the host equipment of Promi-SD uses Hardware Flow Control. Promi-SD is initially set to Use of Hardware Flow Control. If your host equipment does not use Hardware Flow Control, set the Hardware Flow Control of Promi-SD to No use.

Promi-SD does not support RS-232 break signal.

↘ Pin Assignment

Promi-SD is DCE device. If your host equipment is DTE, plug Promi-SD directly to the host equipment or use straight RS-232 cable. If your host equipment is DCE, use cross over RS-232 cable (Null modem cable).

Data Loss or Malfunctioning

↘ Hardware Flow Control

When transmitting large data with No use of Hardware Flow Control, Promi-SD will clear the data buffer unexpectedly. This possibility goes higher as the RF transmission environment is bad.

↘ SD Response

The messages of SD response may affect the function of host system. Set ATS10=0 not to send SD response to host system and try again. Refer Appendix B. for details.

Transmission Delay

↘ RF Processing Delay

It takes 30msec approximately for a Promi-SD to complete the data transmission to the other side Bluetooth device. This time delay cannot be reduced and would be bigger as the RF transmission environment is bad. Do not use Promi-SD If your applications cannot allow this time delay.

↘ RF Transmission Environment

If there are lots of Bluetooth device working in a small area and/or the RF communication distance is too long and/or there are some obstacles affecting RF performance, Promi-SD repeats the transmission packet by packet due to interferences and/or low RF performance. This leads the transmission time delay.

5. Specifications

- Bluetooth
- Serial Interface
- Power
- Mechanical Dimensions
- Environmental
- Default Antenna
- Power Consumption
- Wireless Coverage
- Battery

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↘ Bluetooth Interface

- Bluetooth 1.1 specification compatible and qualified
- Protocol: RFCOMM, L2CAP, SDP
- Profiles: Serial Port Profile, Generic Access Profile, Service Discovery Profile
- Radio Frequency: 2.4 ~ 2.4738GHz
- Number of Channels: 79
- Transmission Power Class 2 (Promi-SD101)
- Transmission Power Class 1 (Promi-SD202/SD205, ESD)
- Data Transmission Rate: 380Kbps Max.

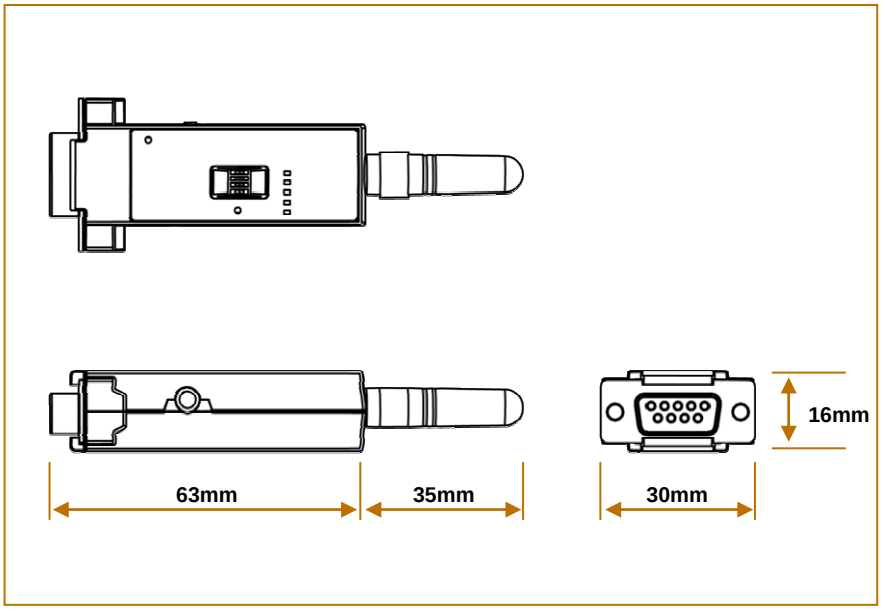
↘ Serial Interface

- EIA RS232C Standard
- Connector: DB9 female
- Data Transmission Rate: 1,200 ~ 230,400bps
- Hardware Flow Control: On/Off

↘ Power

- DC 5 ~ 12V Constant Voltage
- Supply: DC Jack or Pin 9 of DB9

↘ Mechanical Dimensions



↘ Environmental

- Recommended Operational Temperature: -20℃ ~ 70℃
- Recommended Operational Humidity: 90% Max. Non-condensing

↘ Default Antenna

- Type: Helical
- Frequency: 2,400 ~ 2,485GHz
- Gain: Max. 1dBi ±1
- Impedance: 50Ω
- size: 30mm×9mm (W×D)
- weight: 3.5g

↘ Power Consumption

The power consumption varies according to the operation status of Promi-SD. The table below shows the average measuring results in different operation modes with 1m communication distance.

Operation Status	Consumption SD202
Not plugged into Serial port	17mA
Plugged into Serial port	31mA
Inquiry Scan	106mA
Page Scan	106mA
Inquiry & Page Scan	64mA
Connected as Master device	60mA
Connected as Slave device	37mA
Connected in Park mode as Master device	33mA
Connected in Park mode as Slave device	32mA
Connected and Transmitting Data at 9600bps	66mA
Connected and Transmitting Data at 115200bps	80mA

The power consumption will be increased as the communication distance is getting longer, but never exceeds 106 ㎃ in any case.

↘ Wireless Coverage

The table below shows the average measuring results in open space. These results can vary according to the environmental conditions.

Antennas for two Promi-SD units	Maximum Distance (SD202/205)	Maximum Distance (SD101)
Stub Antenna – Stub Antenna	100m	30m
Stub Antenna - Dipole Antenna	150m	50m
Dipole Antenna - Dipole Antenna	200m	80m
Patch Antenna - Dipole Antenna	400m	150m
Patch Antenna - Patch Antenna	1,000m	300m

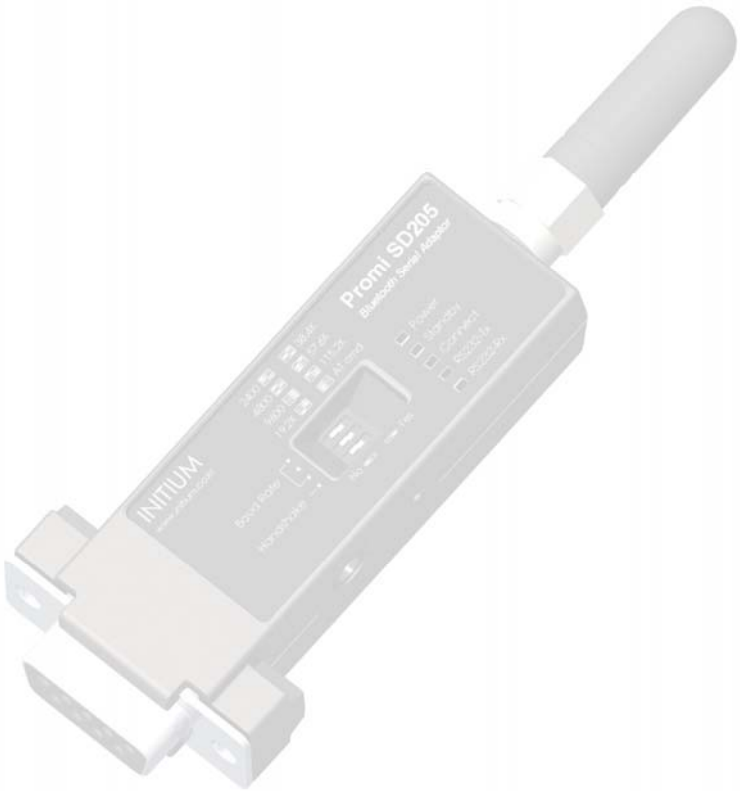
↘ Battery (SD101 only)

- Type: Lithium-Ion
- Capacity: 3.8V, 190mAh
- Protector: Temperature and current voltage protection
- Charging Time: 1Hour 45 Minutes ±15Minutes
- Full-load Runtime: 5Hours when transmitting data at 115200kbps

- Can be charged up to 500 times approximately

Appendix A. AT Commands

- Terminology
- Command Category
- Command Description
- Command Validity



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Terminology

↘ AT Command

AT command set is the de facto standard language for controlling modems. The AT command set was developed by Hayes and is recognized by virtually all personal computer modems. Promi-SD provides the extended AT command set to control and configure the serial parameters and Bluetooth connection.

↘ AT Response

Promi-SD replies to AT commands with 4 kinds of message, 'OK', 'ERROR', 'CONNECT' and 'DISCONNECT'.

↘ Operation Mode

- Mode0: Waiting for AT commands
- Mode1: Attempting to connect to the last connected Bluetooth device
- Mode2: Waiting for the connection from the last connected Bluetooth device
- Mode3: Waiting for the connection from any other Bluetooth devices

↘ Operation Status

- Standby: Waiting for AT commands
- Pending: Executing tasks
- Connect: Transmitting data

↘ Security

- Authentication: Pin code (or Pass key)
- Encryption: Data encryption

↘ Symbols

The symbols are used for the description of command syntax as follows:

Symbol	Meaning	ASCII Code
↵	Carriage return	0x0D
↙	Line feed	0x0A
↯	Carriage return + Line feed	
112233445566	Bluetooth device address	
n or m	One digit decimal number	
to	Timeout in second	

Command Category

Command Category		Index	AT commands
RESET		1	ATZ
		2	AT&F
SERIAL PORT		3	AT
		4	AT+UARTCONFIG,b,p,s
		5	AT+USEDIP?
BLUETOOTH	Information	6	AT+BTINFO?
		7	AT+BTINQ?
		8	AT+BTLAST?
	Mode	9	AT+BTMODE,n
	Status	10	+++
		11	AT+SETESC,nn
		12	ATO
		13	AT+BTCANCEL
		14	AT+BTSCAN
		15	AT+BTSCAN,n,to
		16	AT+BTSCAN112233445566,to
	Connection	17	ATD
		18	ATD112233445566
		19	ATH
	Security	20	AT+BTKEY=$string
		21	AT+BTSD?
		22	AT+BTCSD
		23	AT+BTFP,n
		24	AT+BTSEC,a,e
	Miscellaneous	25	AT+BTNAME=$string
		26	AT+BTLPM,n
S-REGISTER		27	AT&V
		28	ATSnn?
		29	ATSnn=mm

Command Description

1 ATZ↵

SD Response	↯OK↯
Purpose	Software Reset
Description	This is the same effect as power off and on. This command disconnects Bluetooth device, and stops ongoing task. After rebooting, the status is decided by the preset operation mode. Some AT commands need ATZ to take effect.
Reference	AT&F, AT+BTCSD, AT+UARTCONFIG

2 AT&F↵

SD Response	↯OK↯
Purpose	Hardware reset
Description	This is the same effect as initialization by reset button. All parameters are initialized to factory defaults. The storage of Promi-SD is cleared completely.
Reference	ATZ

3 AT↵

SD Response	↯OK↯
Purpose	Check the connection status with host equipment
Description	Check if the connection to host equipment is normal. The serial parameters of Promi-SD must be same as those of host equipment. If not, SD response is none or 'ERROR' or abnormal sequence of strings.
Reference	AT+UARTCONFIG, ATZ, AT&F

4 AT+UARTCONFIG,Baudrate,Parity,Stopbit↵

SD Response	↯OK↯
Purpose	Set Serial parameters
Parameters	*Baudrate*=1200/2400/9600/14400/19200/38400/57600/115200/230400 (Default=9600) *Parity*=N/E/O (Default=N) *Stopbit*=1/2 (Default=1)
Description	The Serial parameters can be set or changed. The factory default is 9600, N, 1. To take effect of this command, ATZ or power off and on.
Reference	AT, ATZ, AT&F, ATS
Example	AT+UARTCONFIG,38400,E,1

5 AT+USEDIP? ↵(SD205 only)

SD Response	↯*m*↯
Purpose	Check the Baud rate set by dip switch
Description	*m*=0: Set to 'AT cmd' *m*=1: Set to other than 'AT cmd'
Reference	AT, ATZ, AT&F, ATS

6 AT+BTINFO? ↵

SD Response	↯112233445566,DeviceName,Mode,Status,Auth,Encryp,FlowControl↯ ↯OK↯
Purpose	Display Bluetooth settings
Description	The current Bluetooth settings are displayed including BD address, Device name, Operation mode, Operation status, Authentication, Data Encryption, and Hardware Flow Control. The initial value of Device name is 'PSDv3b-445566'. PSD stands for Promi-SD, v3b for the version of firmware, and 445566 for the last 6 digits of BD address. Mode=MODE0/MODE1/MODE2/MODE3 Status=STANDBY/PENDING/CONNECT Auth=0/1 (Authentication is not activated when 0) Encrypt=0/1 (Encryption is not activated when 0) FlowControl=HWFC/NoFC
Reference	AT+BTNAME, AT+BTMODE, AT+BTSEC, ATS14?
Example	↯000B530011FF,INITIUM,MODE0,PENDING,1,1,HWFC↯

7 AT+BTINQ? ↵

SD Response	↯112233445566,FriendlyName,CoD↯ ↯112233445566,FriendlyName,CoD↯ ↯112233445566,FriendlyName,CoD↯ ↯OK↯
Purpose	Search Bluetooth devices nearby
Description	The Bluetooth devices in Inquiry scan mode nearby are displayed with their BD addresses, Device names, and Class of device. Maximum 10 devices are scanned for 30 seconds.
Reference	AT+BTSCAN, ATD, AT+BTINFO?

8 AT+BTLAST? ↵

SD Response	↯112233445566↯ ↯OK↯
Purpose	Display the BD address of the last connected device
Description	The Bluetooth device connected to this Promi-SD last time is displayed with its BD address.
Reference	AT+BTSCAN, ATD, AT+BTINFO?, AT+BTINQ?

9 AT+BTMODE,*n*↵

SD Response	↯OK↯

Purpose	Set operation mode
Parameters	*n*=0: MODE0 (Default) *n*=1: MODE1 *n*=2: MODE2 *n*=3: MODE3
Description	When the operation status is 'Pending' currently, change the status to 'Standby' with AT+BTCANCEL prior to this command. To take effect of this command, ATZ or power off and on.
Reference	AT+BTINFO?
Example	AT+BTMODE,2 ↯OK↯ ATZ

10 +++

SD Response	↯OK↯
Purpose	Convert the operation status of 'Connect' to 'Standby'
Description	In 'Connect' status, data from host is transmitted to the other side Bluetooth device, and any AT command is not accepted but this command, which is not echoed on the screen. When Promi-SD encounters a character '+' from host, it stops the data transmission and waits for next 2 characters. If the next 2 characters are both '+', it restart to transmit data including the first '+' as well. If not, it converts the operation status to 'Standby'. If the data from host includes '+++', it will convert the operation status to 'Standby' unexpectedly. Notice that Promi-SD holds data transmission when it encounters '+', until receiving next character. '+' is an escape sequence character by default, which is changeable by AT+SETESC.
Reference	AT+SETESC, ATO, AT+BTCANCEL

11 AT+SETESC,*nn*↵

SD Response	↯OK↯
Purpose	Change the escape sequence character
Parameters	*nn*=Decimal number of ASCII code (Default=43)
Description	Escape sequence character set to '+' by default is changeable. The parameter *nn* must be a printable character.
Reference	+++, ATO
Example	AT+SETESC,42

12 ATO↵

SD Response	None
Purpose	Convert the operation status of 'Standby' to 'Connect'
Description	You can convert the operation status of 'Standby' to 'Connect' ready to transmit data.
Reference	+++, AT+SETESC

13 AT+BTCANCEL↵

SD Response	↯OK↯
Purpose	Terminate a current executing task
Description	This terminates a current executing task, such as Inquiry scan and Page scan, then converts the operation status to 'Standby'.
Reference	AT+BTSCAN, ATD, AT+BTINQ?

14 AT+BTSCAN↵

SD Response	↯OK↯ ↯CONNECT 1122334455666↯
Purpose	Wait for inquiry and connection from other Bluetooth devices
Description	This allows the inquiry and connection from the other Bluetooth devices. The operation status will be in 'Pending' after this command. When connection is made and released, the operation status is back to 'Pending'. To convert the operation status to 'Standby' AT+BTCANCEL must be used. This has the same effect as AT+BTSCAN,3,0. When connection is made with other Bluetooth device, SD response will be 'CONNECT' with its BD address.
Reference	ATD, AT+BTINQ?, AT+BTCANCEL

15 AT+BTSCAN,*n*,*to*↵

SD Response	↯OK↯ ↯CONNECT 1122334455666↯ or ↯OK↯ ↯ERROR↯
Purpose	Wait for inquiry and connection from other Bluetooth devices for a given duration
Parameters	*n*=1: Allows Inquiry scan *n*=2: Allows Page scan *n*=3: Allows both of Inquiry scan and Page scan *to*= Time duration in seconds
Description	For the given *to*, Promi-SD is waiting for the inquiry and connection from other Bluetooth devices. If the parameter of *to* is 0, it will wait forever. When connection is made with other Bluetooth device, SD response will be 'CONNECT' with its BD address. If there is no connection made within this time duration, SD response is 'ERROR' and the operation status becomes to 'Standby'.
Reference	ATD, AT+BTINQ?, AT+BTCANCEL
Example	AT+BTSCAN,2,30

16 AT+BTSCAN1122334455666,*to*↵

SD Response	↯OK↯ ↯CONNECT 1122334455666↯ or ↯OK↯ ↯ERROR↯

Purpose	Wait for connection by the Bluetooth device with given BD address
Parameters	112233445566=BD address *to*= time duration in seconds
Description	For the given *to*, Promi-SD is waiting for the connection from the Bluetooth device with the given BD address. If the parameter of *to* is 0, it will wait forever. When connection is made with the Bluetooth device, SD response will be 'CONNECT' with its BD address. If there is no connection made within this time duration, SD response is 'ERROR' and the operation status becomes to 'Standby'.
Reference	ATD, AT+BTINQ?, AT+BTCANCEL
Example	AT+BTSCAN000B530011FF,30

17 ATD↵

SD Response	↯OK↯ ↯CONNECT 1122334455666↯ or ↯OK↯ ↯ERROR↯
Purpose	Connect to the last connected Bluetooth device
Description	Promi-SD saves the BD address of the Bluetooth device most recently connected. ATD can make connection to it without input its BD address. If it fails to make connection, SD response is 'ERROR'.
Reference	AT+BTINQ?, AT+BTSCAN

18 ATD112233445566↵

SD Response	↯OK↯ ↯CONNECT 1122334455666↯ or ↯OK↯ ↯ERROR↯
Purpose	Connect to the Bluetooth device with given BD address
Parameters	112233445566=BD address
Description	Promi-SD attempts to connect to the Bluetooth device with the given BD address. To make successful connection, the Bluetooth device must be in Page scan. This attempt continues for 5 minutes. If it fails to make connection, SD response is 'ERROR'.
Reference	AT+BTINQ?, AT+BTSCAN
Example	ATD000B530011FF

19 ATH↵

SD Response	↯OK↯ ↯DISCONNECT↯
Purpose	Release the current connection
Description	The current Bluetooth connection is released normally. It takes about 30 seconds to detect an abnormal disconnection such as power off and moving out of service range.
Reference	ATD, AT+BTSCAN

20 AT+BTKEY=*$string*↵

SD Response	↯OK↯
Purpose	Change pin code
Parameters	*$string*= New pin code (Default="1234")
Description	Pin code is a string, which allows 16 alpha-numeric characters maximum. Based on this pin code, Promi-SD generates a link key which is used in actual authentication process.
Reference	AT+BTCSD, AT+BTFP, AT+BTSD?, AT+BTSEC, ATZ, AT&F
Example	AT+BTKEY="apple"

21 AT+BTSD? ↵

SD Response	↯1122334455667↯ ↯OK↯
Purpose	Display the list of Bluetooth devices sharing the pin code
Description	Once a connection is made with pin code, Promi-SD saves the Bluetooth device with its link key generated by pin code. The connection to a device listed in Promi-SD can be made automatically without authentication process. The maximum number of the list is 5.
Reference	AT+BTCSD, AT+BTFP, AT+BTKEY, AT+BTSEC, ATZ, AT&F

22 AT+BTCSD↵

SD Response	↯OK↯
Purpose	Clear the list of Bluetooth devices sharing the pin code
Description	This clears the list of Bluetooth devices with link key in flash memory. To take effect of this command, ATZ or power off and on because the main memory still has the list.
Reference	AT+BTFP, AT+BTKEY, AT+BTSD?, AT+BTSEC, ATZ, AT&F

23 AT+BTFP,*n*↵

SD Response	↯OK↯
Purpose	Set generation of link key every time of connection
Parameters	*n*=0: Inactivate (Default) *n*=1: Activate
Description	If *n* is set to 1, Promi-SD asks pin code every time of connection. This is used to level up the security.
Reference	AT+BTCSD, AT+BTKEY, AT+BTSD?, AT+BTSEC, ATD, ATZ, AT&F

24 AT+BTSEC,*Authentication,Encryption*↵

SD Response	↯OK↯
Purpose	Set authentication and data encryption
Parameters	*Authentication*=0: Inactivate (Default) *Authentication*=1: Activate *Encryption*=0: Inactivate (Default) *Encryption*=1: Activate

Description	If the authentication is activated, the pin code must be set by AT+BTKEY command. Data encryption cannot be used when authentication is not activated, i.e. *Authentication*=0 and *Encryption*=1 is not valid.
Reference	AT+BTCSD, AT+BTFP, AT+BTSD?, AT+BTSD?, ATZ, AT&F

25 AT+BTNAME=*$string*↵

SD Response	↯OK↯
Purpose	Change device name
Parameters	*$string*= New device name (Default="PSDv3b-445566")
Description	Promi-SD can have a user friendly name to identify easily. The name allows 30 alpha-numeric characters maximum.
Reference	AT+BTINFO?, AT+BTINQ?
Example	AT+BTNAME="My-Promi-SD"

26 AT+BTLPM,*n*↵

SD Response	↯OK↯
Purpose	Set low power mode
Parameters	*n*=0: Inactivate (Default) *n*=1: Activate
Description	During no data transmission, Promi-SD can be in low power mode to save the power consumption. It takes a few seconds to wake up Promi-SD in low power mode.

27 AT&V↵

SD Response	↯S0:m0;S1:m1; …Sn:mn↯ ↯OK↯
Purpose	Display all the S-register
Description	All parameters are stored at S-register in flash memory. These values are sustained until hardware reset.
Reference	ATS

28 ATS*nn*? ↵

SD Response	↯value↯ ↯OK↯
Purpose	Display a given S-register
Parameters	*nn*= Address of S-register
Description	A specific S-register is displayed.
Reference	AT&V

29 ATS*nn=mm*↵

SD Response	↯OK↯

Purpose	Change S-register value
Parameters	nn= Address of S-register mm= New value of S-register
Description	Some S-registers are optimized for the overall performance and protected from an arbitrary change by user. When users try to change these S-registers, SD response is 'ERROR'. For details of S-register, refer Appendix. B.
Reference	AT&V
Example	ATS10=0

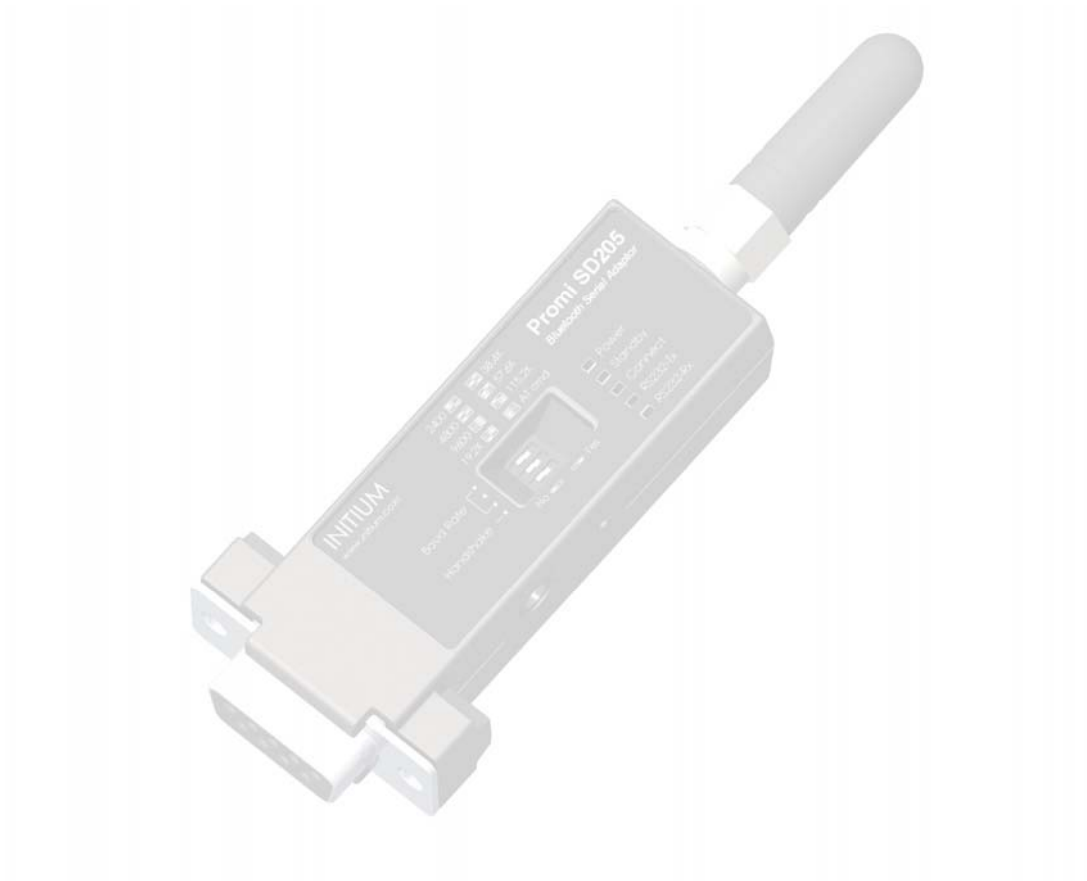
Command Validity

AT Command	Operation Status		
	Standby	Pending	Connect
AT	○	○	
ATZ	○	○	
AT&F	○	○	
AT+BTINQ?	◎		
ATD112233445566	◎		
ATD	◎		
AT+BTSCAN	◎		
AT+BTSCAN,n,to	◎		
AT+BTSCAN112233445566,to	◎		
AT+BTCANCEL		○	
+++			○
AT+SETESC	◎		
ATO	●		
ATH	●		
AT+BTSEC,Auth,Encr	◎		
AT+BTLAST?	○	○	
AT+BTMODE,n	◎		
AT+BTNAME="Name"	◎		
AT+BTKEY="nnnn"	◎		
AT+BTINFO?	○	○	
AT+BTLPM,n	◎		
AT+BTSD?	○	○	
AT+BTCSD	◎		
AT+BTFP,n	◎		
AT+UARTCONFIG,b,p,s	◎		
AT+USEDIP?	○	○	

◎ Valid only when Promi-SD is not connected to other Bluetooth device.

● Valid only when Promi-SD is connected to other Bluetooth device.

Appendix. B S-Register



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S-Register

S-registers contain 46 parameters of Promi-SD. These are stored in flash memory and sustained the values unless hardware reset is executed. The value of S-register can be accessed and changed with ATS command by user. Some S-registers not shown below are set to maximize the performance of Promi-SD. Thus it is not recommended to change these S-registers.

Change the value of S-register only in Standby status.

↘ S1: Force to Reconnect (default 1)

S1=0, Promi-SD in Mode1 does not try reconnection when disconnected.

S1=1, Promi-SD in Mode1 keeps trying reconnection when disconnected.

↘ S3: Stream UART Policy (default 0)

S3=0, the priority of UART streaming is throughput.

S3=1, the priority is latency, which minimizes the delay of data transmission. This is useful in case of transmiting very small data quickly.

↘ S4: Enable Remote Name Query (default 1)

S4=0, Promi-SD inquires only BD address. This speeds up the inquiry process.

S4=1, Promi-SD inquire BD address, device name and class of device.

↘ S10: Enable SD Response (default 1)

S10=0, Promi-SD does not send SD responses to host system.

S10=1, Promi-SD send SD responses to host system.

↘ S11: Enable Escape (default 1)

S11=0, Promi-SD does not allow escape sequence character. The operation status of Connect cannot be changed to Standby. As Promi-SD skips the process detecting escape sequence character, the more efficient data transmission is expected.

S11=1, Promi-SD allow escape sequence character. Whenever it is needed, the Connect status can be changed to Standby.

↘ S12: Clear Data Buffer When Disconnected (default 0)

S12=0, Promi-SD does not clear the data buffer received from host system when disconnected.

S12=1, Promi-SD clears the data buffer when disconnected.

↘ S14: Enable DTR Transfer (default 1, SD202/205 only)

S14=0, DTR/DSR signal is transferred to loop-back.

S14=1, DTR signal is transferred to DSR of remote device.

↘ S15: Enable Disconnect by DTR (default 0, SD202/205 only)

S15=0, DTR signal cannot release the connection.

S15=1, The connection can be released when DTR signal is off.

↘ S24: Maximum Number of Inquiry Result (default 10)

The maximum number of inquiry list can be controlled.

↘ S28: Escape Sequence Character (default 43)

The decimal number of the ASCII code of escape sequence character can be controlled. The initial value is 43, the ASCII code of '+'.

↘ S29: Error Code

The most recent error code is stored in this register. User cannot change this value.

↘ S31: Page Timeout (default 300)

This is the timeout in seconds to attempt connection with ATD command.

↘ S33: Inquiry Timeout (default 30)

This is the timeout in seconds to execute inquiry scan.

↘ S37: Supervision Timeout (default 16000)

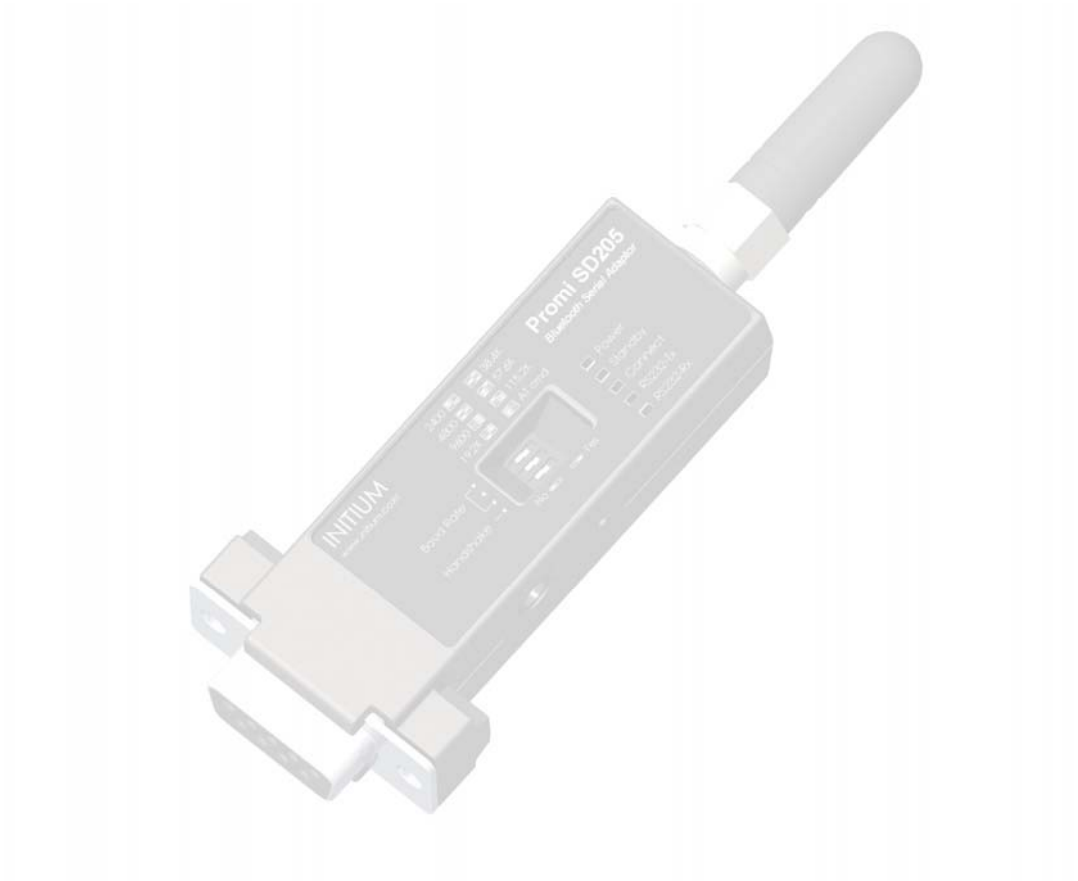
This is the timeout in 625μsec to presume disconnection, which is set to 16000 initially. 16000×625μsec=10sec)

The smaller the value becomes, the more quickly Promi-SD can detect an abnormal disconnection. But when the communication is suspended for some environmental reasons, it may be regarded as disconnection.

↘ S46: BD Address of Last Connected Device

This saves the BD address of the Bluetooth device connected most recently.

Appendix C. Type Approvals



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TCB

GRANT OF EQUIPMENT AUTHORIZATION

TCB

Certification
Issued Under the Authority of the
Federal Communications Commission
By:

Compliance Certification Services
561F Monterey Road
Morgan Hill, CA 95037
United States

Date of Grant: 08/04/2003
Application Dated: 08/04/2003

INITIUM Co., Ltd.
8F. Gongdeok Bldg. 272-6 Seohyun Bundang
Sungnam Kyunggi, 463-824
South Korea

Attention: Yong Park , Chief Engineer

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: QOCPROMISD
Name of Grantee: INITIUM Co., Ltd.
Equipment Class: Part 15 Spread Spectrum Transmitter
Notes: Bluetooth Serial Adapter W/ RS232 Interface

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
CE	15C	2402.0 - 2480.0	0.0012		

Output power listed is conducted. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter. End-users must be provided with specific operating instructions for satisfying RF exposure compliance requirements.

CE: This device has shown compliance with the conducted emissions limits in 15.107, 15.207, or 18.307 adopted under FCC 02-157 (ET Docket 98-80). The device may be marketed after July 11, 2005, and is not affected by the 15.37(j) or 18.123 transition provisions.

EMCC DR. RAŠEK

Notified Body Directive 99/5/EC
Competent Body EMC Directive 89/336/EEC
Notified Body EMC Directive 89/336/EEC
FCB under the Canada-EC MRA
TCB under the USA-EC MRA

EC Identification No. 0678

Designated by the German Regulator RegTP

to act as a Notified Body in accordance with the R&TTE Directive 1999/5/EC of 9. March 1999

EC-R&TTE CERTIFICATE

Registration No.	G102006S
Certificate Holder	Initium Co., Ltd. #716. Kumgang Hightech Valley Bldg. 133 Sangdaewon Jungwon Sungnam Kyunggi 462-120 South Korea
Product Designation	Bluetooth Serial Adapter, Model Promi SD202
Product Description	Wideband transmission system in the 2.4 GHz ISM band
Manufacturer	Initium Co., Ltd. #716. Kumgang Hightech Valley Bldg. 133 Sangdaewon Jungwon Sungnam Kyunggi 462-120 South Korea

Essential Requirement		Applied Specifications / Standards	Documentary Evidence	Result
Art. 3.1(a)	Health	EN 50385	Declaration of Conformity	conform
Art. 3.1(a)	Safety	EN 60950	Test Report SKTCES-041108-039	conform
Art. 3.1(b)	EMC	EN 301 489-1/-17	Test Report SKTCEE-041116-182	conform
Art. 3.2	Radio	EN 300 328	Test Report SKTCET-041117-012	conform

The product shall be marked with the CE conformity marking and our Notified Body number as shown on the right. CE 0678 ①

The scope of evaluation relates to the submitted documents only.

This Certificate is issued in accordance with Annex IV of the R&TTE Directive 1999/5/EC of 9th March, 1999 and is only valid in conjunction with the attached Annex.

Ebermannstadt,
2004-11-26

Eddo de Buhr
Notified Body

GERMAN NOTIFIED BODY · DEUTSCHE BENANNTE STELLE ·

EMCCert DR. RAŠEK • Boelwiese 5, 91320 Ebermannstadt, Germany • Tel.: +49-9194-9016 • Fax: +49-9194-8125
E-mail: emc.cert@emcc.de • Web: http://www.emcc.de

Annex to Certificate Registration No. G102006S
Date 2004-11-26
Page 1 of 1

Technical Construction File (TCF) Details

To demonstrate conformity with Article 3.1(a) Health			
Applied Standards	Version	Applied Standards	Version
EN 50385			
Report or Certificate No.	Issue Date	Issued by	
Declaration of Conformity	2004-11-17	Initium Co., Ltd.	
To demonstrate conformity with Article 3.1(a) Safety			
Applied Standards	Version	Applied Standards	Version
EN 60950	2000		
Report or Certificate No.	Issue Date	Issued by	
SKTCES-041108-039	2004-11-08	SK TECH CO., LTD.	
To demonstrate conformity with Article 3.1(b) EMC			
Applied Standards	Version	Applied Standards	Version
EN 301 489-1	V1.4.1		
EN 301 489-17	V1.2.1		
Report or Certificate No.	Issue Date	Issued by	
SKTCEE-041116-182	2004-11-16	SK TECH CO., LTD.	
To demonstrate conformity with Article 3.2 Spectrum Efficiency			
Applied Standards	Version	Applied Standards	Version
EN 300 328	V1.4.1		
Report or Certificate No.	Issue Date	Issued by	
SKTCET-041117-012	2004-11-17	SK TECH CO., LTD.	
Declaration of Conformity			
Signed by		Date	
Je-Rook Ryu		2004-11-17	
Technical Documentation			
Block diagram			
Parts list			
Schematic diagram			
Antenna Specifications			

EMCCert DR. RAŠEK • Boelwiese 5, 91320 Ebermannstadt, Germany • Tel.: +49-9194-9016 • Fax: +49-9194-8125
E-mail: emc.cert@emcc.de • Web: http://www.emcc.de

Bluetooth™ Qualified Product Notice

Bluetooth Qualification Body
Uon-Chae Song
TUV Rheinland Korea Ltd.

Applicant Details

Applicant	INITIUM
Address	8F Gongdeok Bldg 272-6, Seohyun-dong, Bundang-gu, Sungnam-city, Kyunggi-do, 463-824, Korea
Person Responsible	Yong-Hwan, Park
Phone No	+82-31-708-6107
Fax No	+82-31-708-4590
E-mail	park@initium.co.kr
URL	http://www.initium.co.kr

Product Identification

Product Name	Bluetooth Serial Adapter
Product ID	Promi™-SD
Hardware Version	2.1
Software Version	v3b
Product Type	Product
Product Category	Computer Accessories
Supported profiles	GAP, Serial-Device A , Serial-Device B
Product Description	Promi™-SD is Bluetooth serial adaptor for point-to-point wireless communication replacing conventional RS232 cables. Promi™-SD can be operated without additional software and does not require hardware change for applying.

Reference Documents

Applied Documents	Version	Issued date
Bluetooth Specifications	1.1	2001-02-22
Test Case Reference List	TCRL_V1-1	2003-03-24
TCRL Addendum	TCRL_V1.1 Addendum	2003-08-12
Qualification Program Reference Document	1.0	2002-02-07

Bluetooth Product Listing Identification

QPN Reference No.	QPN-BITK-030013
Assessment date	October 30, 2003
Listing date	October 30, 2003

This Qualified Product Notice is an essential part of the Bluetooth Qualification Program and shows the acceptance of this product as a qualified Bluetooth device. The Qualified Product Notice is only valid in conjunction with Annex A.

Hereby I certify that the product named above is qualified in accordance to the above reference documents as a Bluetooth end product for the Covered Functionality defined in Compliance Portion Declaration.

Seoul , October 30, 2003

place , date

Uon-Chae Song

Bluetooth is a trademark owned by Bluetooth SIG Inc, U.S.A and licensed to the member whose qualified product is listed in this certificate, Third-party brands and names are the property of their respective owner.

Page 1 of 1

認　　証　　書

特定無線設備の種別	証明規則第2条第19号の無線設備 2.4GHz 帯高度化小電力データ通信システム
電波の型式、周波数及び空中線電力	F1D　2441MHz 0.001W
型式又は名称	Promi-SD202
認証取扱業者名	株式会社ブルーネクストジャパン
製造者名	株式会社ブルーネクストジャパン
認証番号	004NYCA0059
認証をした年月日	平成 16 年 4 月 20 日

上記のとおり、電波法第38条の24第2項の規定に基づく認証を行ったものであることを証する。

平成 16 年 4 月 20 日

株式会社　ケミトックス

TCB

GRANT OF EQUIPMENT AUTHORIZATION

TCB

Certification

Issued Under the Authority of the

Federal Communications Commission

By:

EMCC Dr. Rasek
Moggast
D-91320 Ebermannstadt,
Germany

Date of Grant: 12/17/2004

Application Dated: 12/17/2004

INITIUM Co., Ltd.
#716, Kumgang Hightech Valley Bldg. 133
Sangdaewon Jungwon
Sungnam Kyunggi, 462-120
South Korea

Attention: Je-Kook Ryu , Managing Director

NOT TRANSFERABLE

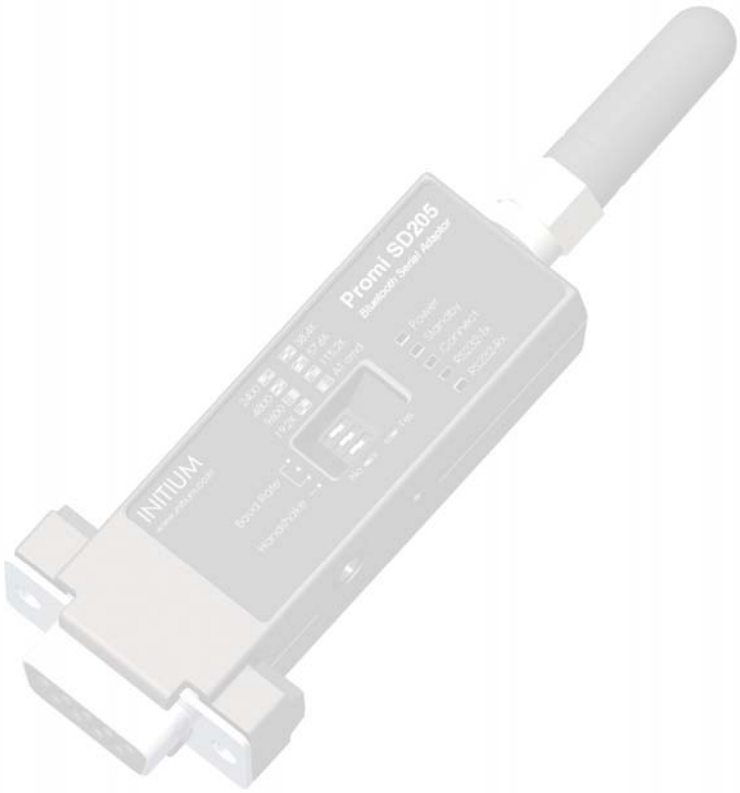
EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: QOCPROMISD202
Name of Grantee: INITIUM Co., Ltd.
Equipment Class: Part 15 Spread Spectrum Transmitter
Notes: Bluetooth Serial Adapter

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	15C	2402.0 - 2480.0	0.01084		

Power output listed is peak conducted. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter. End-users must be provided with specific operating instructions for satisfying RF exposure compliance.

Appendix D. Technical Support



get **UNWIRED**, it's easy!

Use this form to request technical support for Promi-SD. Individual form should be filled out for each Promi-SD in question. Referring to the example on separate sheet, please provide as much information as possible so we may resolve and respond to your inquiry promptly. When you have finished, submit this form by e-mail to support@initium.co.kr or by fax to +82 31 782-3231.

NOTE: Before you contact technical support, please have a look at our FAQ. Chances are, you will find an instant answer to your problem.

✓ indicates a required field.

↘ **User Contact Information**

Name ✓	
Company	
E-mail ✓	
Phone ✓	
Fax ✓	

↘ **Overall Hardware Setup** ✓

(Depict or describe actual hardware connections)

↘ **Host Device** ***(to which Promi-SD is attached)***

Description ✓				
Serial Port Setup	*Port*		*Parity* ✓	
	Baud Rate ✓		*Stop Bits* ✓	
	Data Bits ✓		*Flow Control* ✓	
Comments				

↘ **Promi-SD**

Model Name ✓		BD Address* ✓	
S-Register** ✓			

* BD Address is the 6-digit number labeled on the product.

** As for S-Register, the values are shown by "AT&V" command on a PC running Serial Port program (e.g. HyperTerminal). See the User's Manual for details.

↘ **Pin Assignment to Promi-SD**

Promi-SD				Host Device		
Direction	Signal	Pin #		Pin #	Signal	Direction
Out	CD	1	↔			
Out	TxD	2	↔			
In	RxD	3	↔			
In	DSR	4	↔			
–	GND	5	↔			
Out	DTR	6	↔			
In	CTS	7	↔			
Out	RTS	8	↔			
In	Vcc	9	↔			

↘ **Bluetooth Connection: This Promi-SD is connected to (*mark one*)**

☐ an another Promi-SD		
☐ a Promi-ESD		
☐ a Promi-MSP		
☐ others	Model ✓	
	Manufacture	
	Application S/W	

↘ **Environment for RF Communication**

Distance* ✓	
Obstacles** ✓	

↘ **Problems you have**

* Distance is a linear distance between Promi-SD and the other side Bluetooth device.
** Obstacles are things affecting RF performance in the middle of Promi-SD and the other side Bluetooth device, such as walls, partitions, other equipments, etc.